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ORE STOCKS ON LAKE ERIE DOCKS.

Reports to the Marine Review from dock managers at all Lake Erie ports show that there was 2,848,194 tons of ore (gross tons) on dock May 1, as against 3,050,183 tons on the same date last year. They also show that in the year ended May 1 there was moved over these docks to furnaces 17,216,065 tons of ore, which is nearly 3,000,000 tons in excess of the amount that passed over the docks in the previous year. The 2,848,194 tons of ore on dock May 1 is what may be called old ore. Considerable ore was moved in April this year. It was nearly all shipped direct to furnaces, but such of it as was placed on dock is not included in the May 1 stock of ore. This new ore is not included for the reason that if it were included it would interfere with the value of the May 1 stock figures for comparative purposes.

From the standpoint of the vessel interests there is little encouragement in dock reports that shows stocks of ore practically equal to last year. This is especially true when it is understood that there was more ore moved in April of this year than had been moved up to June 1 a year ago.

The figures above showing the total ore passing to furnaces over Lake Erie docks in the year ended with the first of the present month are found in this way: We know that on Dec. 1, 1901, Lake Erie docks contained 5,859,663 tons of ore. If we deduct from this 2,848,194 tons, the amount now on dock, we find that shipments to furnaces from Lake Erie ports during the winter period (Dec. 1 to May 1) amounted to 3,011,469 tons, which, added to 14,204,596 tons, the amount shipped to furnaces during the navigation season in 1901, gives 17,216,065 tons as the entire consumption of ore from Lake Erie ports during the year ended May 1, 1902; against 14,468,260 tons in the year ended May 1, 1901; 15,882,881 tons in the year ended May 1, 1900; 12,122,982 tons in the year ended May 1, 1899, and 10,209,488 tons in the year ended May 1, 1898. The following tables give full details of stocks and shipments to furnaces during several years past:

IRON ORE ON LAKE ERIE DOCKS—GROSS TONS.

Ports.	Opening of Navigation.			Close of Navigation.		
	May 1, 1902.	May 1, 1901.	May 1, 1900.	Dec. 1, 1901.	Dec. 1, 1900.	Dec. 1, 1899.
Toledo	111,511	138,457	52,616	254,196	242,375	186,422
Sandusky	37,400	63,148	4,300	47,384	95,111	23,184
Huron	129,635	135,043	48,412	231,501	211,377	164,480
Lorain	96,992	140,562	126,212	195,863	251,838	337,822
Cleveland	624,865	806,119	386,291	1,378,060	1,337,445	1,200,806
Fairport	472,325	306,706	282,298	710,590	611,717	692,147
Ashtabula	924,742	1,046,974	678,789	1,769,145	1,811,459	1,902,598
Conneaut	152,891	69,755	8,649	604,106	630,514	468,808
Erie	223,972	225,412	97,894	470,718	480,734	361,335
Buffalo	73,861	118,007	35,195	198,100	232,100	192,681
Total	2,848,194	3,050,183	1,720,656	5,859,663	5,904,670	5,530,283

IRON ORE ON LAKE ERIE DOCKS, MAY 1 OF EACH YEAR FOR TEN YEARS PAST.

Year.	Gross tons.	Year.	Gross tons.
1902	2,848,194	1897	3,256,497
1901	3,050,183	1896	1,949,698
1900	1,720,656	1895	2,642,890
1899	2,073,254	1894	2,588,370
1898	3,167,915	1893	2,095,797

IRON ORE SHIPMENTS, LAKE ERIE PORTS TO FURNACES, FULL YEARS.

Year ending	Gross tons.	Year ending	Gross tons.
May 1, 1902	17,216,065	May 1, 1899	12,122,982
May 1, 1901	14,468,260	May 1, 1898	10,209,488
May 1, 1900	15,882,881	May 1, 1897	6,719,633

IRON ORE SHIPMENTS, LAKE ERIE PORTS TO FURNACES, DURING WINTER PERIOD, DEC. 1 TO MAY 1.

Winter of	Gross tons.	Winter of	Gross tons.
1901-02	3,011,469	1898-99	3,063,153
1900-01	2,854,487	1897-98	2,755,84
1899-00	3,809,627	1896-97	1,698,487

LAKE FREIGHT MATTERS.

All reports from iron and steel centers are still of a very encouraging kind—manufacturers still booking orders for months ahead and imports increasing on account of the shortage of material—but the vessel interests of the lakes are not sharing in this prosperity as far as profits are concerned. A long season, due to an early opening, and a surplus of ship capacity are the causes. Already the ships are being used for the storage of ore, as they are often held as much as a week at Lake Erie ports awaiting opportunity to discharge cargo. If they are to have a share this year in the profits of the iron business to which they are so closely related it must come later in the season. It is not in sight at present. The probability of a strike in the anthracite coal mining regions is a new element of restriction in the lake business that is of considerable importance. A correspondent who is in touch with the hard coal situation as it relates to lake business out of Buffalo says:

"If the miners elect to strike it is altogether likely that the strike will last three months at least, for both parties are in prime condition to engage in a long struggle. We are at the beginning of the season when for domestic uses but little hard coal is required. In the east hard coal is almost the only fuel used, but as there has been more or less expectation in that section of a strike this spring, they are probably as well prepared as they ever could be for a strike. The miners have for more than a year and a half had steady work, or as steady as they care to have, as they will not work steadily for any great length of time anyway, and with the summer before them their needs are fewer than in the winter season; and besides, the demand for labor is so great that all of them that care to can find employment, if not in their own immediate neighborhoods, they will not have to go far to find it. Consequently if the strike gets well started it will probably last three months at least; and if it does last as much as three months there will be little or no coal to ship by lake the remainder of the season, for the east will have to be supplied, as the fall and winter demand will have set in by that time for all sections that burn hard coal, but the eastern market will be supplied first, and certainly before any considerable quantity is shipped by lake. It will mean a loss to the lake carrying trade of something like 3,000,000 to 3,500,000 tons, for, without any interference with trade, Oswego, Buffalo and Erie would ship about 4,000,000 tons between now and the close of navigation. What the loss of that much trade to the lakes in this dull season would mean is not a pleasant thing to contemplate."

SUMMARY OF NAVAL CONSTRUCTION.

Steady progress is noted upon all the warships under construction for the United States navy in the various ship yards of the country. Of the late series of contracts the only one not yet laid down is the battleship Nebraska at the works of the Moran Bros. Co., Seattle, Wash., but advices are to the effect that the keel of this mighty vessel will be laid on July 4 and that Seattle will make it the occasion of a town celebration. Following is the summary:

Name.	Building at	Degree of completion, Per cent. Apl. 1.	May 1.
BATTLESHIPS.			
Maine	Wm. Cramp & Sons	87	89
Missouri	Newport News Co.	60	63
Ohio	Union Iron Works	56	57
Virginia	Newport News Co.	0	1
Nebraska	Moran Bros. Co.	0	0
Georgia	Bath Iron Works	8	9
New Jersey	Fore River S. & E. Co.	7	8
Rhode Island	Fore River S. & E. Co.	7	7
ARMORED CRUISERS.			
Pennsylvania	Wm. Cramp & Sons	19	21
West Virginia	Newport News Co.	13	17
California	Union Iron Works	4	5
Colorado	Wm. Cramp & Sons	22	24
Maryland	Newport News Co.	12	16
South Dakota	Union Iron Works	4	4
SHEATHED PROTECTED CRUISERS.			
Denver	Neafie & Levy	77	79
Des Moines	Fore River S. & E. Co.	67	69
Chattanooga	Lewis Nixon	58	59
Galveston	Wm. R. Trigg Co.	56	58
Tacoma	Union Iron Works	41	44
Cleveland	Bath Iron Works	78	81
St. Louis	Neafie & Levy	3	3
Milwaukee	Union Iron Works	0	1
Charleston	Newport News Co.	2	3
MONITORS.			
Arkansas	Newport News Co.	94	95
Nevada	Bath Iron Works	93	93
Florida	Lewis Nixon	90	92
Wyoming	Union Iron Works	81	84
TORPEDO BOAT DESTROYERS.			
Bainbridge	Neafie & Levy	99	99
Barry	Neafie & Levy	99	99
Chauncey	Neafie & Levy	99	99
Dale	Wm. R. Trigg Co.	98	98
Hopkins	Harlan & Hollingsworth	84	89
Hull	Harlan & Hollingsworth	82	87
Lawrence	Fore River S. & E. Co.	99	99
MacDonough	Fore River S. & E. Co.	98	98
Paul Jones	Union Iron Works	87	90
Perry	Union Iron Works	93	96
Preble	Union Iron Works	90	93
Stewart	Gas Engine & Power Co.	66	70
Truxton	Maryland Steel Co.	88	92
Whipple	Maryland Steel Co.	85	90
Worden	Maryland Steel Co.	85	89
TORPEDO BOATS.			
Stringham	Harlan & Hollingsworth	98	98
Goldsborough	Wolff & Zwicker	94	94
Blakely	Geo. Lawley & Son	98	98
DeLong	Geo. Lawley & Son	98	98
Nicholson	Lewis Nixon	97	98
O'Brien	Lewis Nixon	98	98
Thornton	Wm. R. Trigg Co.	98	99
Tingey	Columbian Iron Works	74	74
Wilkes	Gas Engine & Power Co.	96	98
SUBMARINE TORPEDO BOATS.			
Plunger	Lewis Nixon	85	92
Adder	Lewis Nixon	99	99
Grampus	Union Iron Works	66	70
Moccasin	Lewis Nixon	98	99
Pike	Union Iron Works	60	64
Porpoise	Lewis Nixon	95	97
Shark	Lewis Nixon	92	95

The advantage of having ore delivered direct from ships to furnaces is evidently an important factor of late with the promoters of new blast furnace enterprises. It is significant that eight furnaces, plans for which have been undertaken within the past few months, are all to be located in lake cities—Chicago, Cleveland, Toledo, Detroit and Buffalo. They are all to make foundry iron.

A company has been formed in London under the title of the British Submarine Boat Co. to build submarines in England. It has acquired the patents of the French inventor, Goubet, as well as two submarines already built by him, and has secured the services of the inventor, his son and a trained assistant.

TERMS OF THE GREAT SHIPPING COMBINATION.

The agreements under which the shipping combination was effected have just been made public. They are designated as "provisional agreements for the purpose of the acquisition, on or before Dec. 31, 1902, of the White Star, Dominion, American and Atlantic Transport lines, to be organized under the direction of the vendors, to the satisfaction of the bankers, namely, the Morgans, under the law of the state of New York, or such other state as may be selected."

Ismay, Imrie & Co., Mills & Co., Messrs. Griscom and Wiedener and Mr. Bernard Baker, the vendors, receive for their stock $120,000,000 in stock and $50,000,000 in 4½ per cent. debenture collateral trust bonds. Of the $120,000,000 stock, $60,000,000 is 6 per cent. cumulative preferred and a like amount of common stock, which is limited to 10 per cent. dividends. White Star line shares are to be exchanged on a basis of ten times the line's net profits in 1901, and Dominion line shares at ten times the net profits of that line in the year 1900. The American and Atlantic Transport lines are taken over at a combined valuation of $34,158,000, subject to 5 per cent. bonds of the American line to the amount of $19,686,000.

In the papers the combination is referred to as the corporation, and it is provided that the acquisition of the White Star line shall be considered as having taken effect on Jan. 1, 1901, from which date all of the line's profits belong to the corporation. The owners of the White Star line, although agreeing that all profits of the line from that date go to the combination, consent to carry on the line's business until the consummation of the general scheme of purchase, and it is provided that for their personal services these sellers shall be paid "such amount in remuneration as shall be fixed by J. Pierpont Morgan of the city of New York." In the matter of making payment for the properties, the agreements provide that the White Star people shall receive 25 per cent. in cash, and 75 per cent. in preferred stock at par, with 37½ per cent. of the total common stock issued, at par. Payment for the Dominion line is to be in the same manner.

The American and Atlantic Transport lines are to receive together $18,314,000 in preferred stock and $915,700 in common stock, with $15,844,000 in cash and such additional cash as may be required not exceeding a rate of 6 per cent. For the Leyland line $11,736,000 is to be paid in cash. The remainder of the capital stock and the bonds go to the vendors, who contribute as working capital for the corporation $786,000 in preferred and $6,643,000 in common stock, and are "to transfer it to the syndicate if and when formed by the bankers, namely the Morgans, for $50,000,000 cash, and in full payment for its services the said $50,000,000 in debentures and also $2,500,000 in preferred and $25,000,000 in common stock." If less than three-quarters of the interest in any line or lines shall be delivered by Dec. 31, 1902, the corporation may decline to take such line or lines. But the vendors promise to use their best efforts to secure the delivery of the three-fourths interests. The general agreement is not to be affected, as to other lines, by the failure to take in any one of the proposed lines. In order to make the agreements binding, the Morgan interests had to form the original syndicate representing $50,000,000 cash prior to April 30 last, which was done. Ismay, Imrie & Co., the White Star people, obligate themselves to keep out of the shipping business for fourteen years. It is agreed that as the White Star line is English and domiciled in England, all questions arising concerning it under the agreement shall be determined according to English law. Disputed questions are to be referred to Price, Waterhouse & Co., London accountants.

In an additional "builders' agreement," the Morgans contract to give all orders for new vessels and for heavy repairs, requiring to be done at a ship yard of the United Kingdom, to Harland & Wolff, except that it is provided that "nothing herein contained shall prevent the purchasers from placing orders for new steamers and repairs at ship yards in the United States." And in return Harland & Wolff agree not to build ships for any persons not in the combination, except the Hamburg-American company, so long as orders from the combination keep the builders' works busy. Harland & Wolff are to be paid for work which they do for the combination the cost of the work plus 5 per cent. on new ships, 10 per cent. on new machinery in old vessels, and 15 per cent. on repairs. This agreement runs for ten years and is terminable thereafter only on five years' notice from either side.

CARNEGIE IN A CONSOLING MOOD.

Andrew Carnegie arrived in London last week and proceeded at once to console the British on the subject of the shipping combination by saying that there is no cause for alarm

"To combine the shipping traffic," said Mr. Carnegie, "is a big order. There is free right of way on the ocean and the tramp steamers are always with us. The merger may give regular daily sailings to passengers, which would be advantageous. I am not in the navigation syndicate, having retired from business and reformed, so I cannot advise you as to the exact character and bearing of the combination. But, in my opinion, the combine is purely a matter of money making. There is no question of patriotism in trade. It does not care a fig for a flag. It is dividends that count. Of course, every citizen worth a cent wishes his own country to be first in everything, and a peaceful, industrial victory is the only genuine one. Victory through war generally costs more than it is worth. If Great Britain continues her costly wars for shadowy ascendancy in distant parts and the United States develops her industrial army there can be only one result—Great Britain will have the shadow and the United States the substance. I think there is no prospect of early legislation permitting British-built ships to get American register. The Americans have resolved to become a maritime power commercially and will soon be able to build ships quite as cheaply as Great Britain. At first the shipping combine will give the present owners higher returns, but regarding the latter prospects I do not care to prophecy. The people of the United States are in sympathy with the new trust. It seems to be a triumph for the flag, and all patriotic Americans, which means all Americans, are naturally pleased. Besides, we have an idea that we can manage all things better than anyone else, and there is ground for this belief."

The first steel rail was rolled at Sault Ste. Marie on May 5.

IN THE LAKE SUPERIOR IRON COUNTRY.

A dispatch from the Lake Superior iron region says: Considerable work is promised for the Vermillion range. This is quite largely owing to the taking of new lands by the Oliver Iron Mining Co., and the settlement of legal difficulties at the Eaton-Merritt tract and the old McComber mine. This latter has already been entered by D. E. Woodbridge of Duluth. He is rapidly getting the water out of the old workings and will have the property thoroughly examined. The Oliver Iron Mining Co. will explore in the vicinity of the McComber during the year and some exploration is promised east from Ely, in a region distant from the railways. A good deal of work is being done on the Penokee range, west of the hitherto productive part of the Gogebic. This work extends from town 45—1 east to town 44—3 west. At Upson the Schlesinger syndicate is working steadily and with encouraging signs, it is said. It is quite probable that a mine will be encountered there. Near Mellen, at the west end of the belt, work is going on with some encouraging symptoms. At the eastern end of the Gogebic some exploration is also under way, but work that looked satisfactory some months ago is now not so favorable. As depth is reached at the new Maas shaft of the Cleveland Cliffs Iron Co. in the Negaunee district, the work becomes very slow—sinking but 2 or 3 in. in twenty-four hours. In fact, since the middle of February the shaft has gone down but about 12 ft. Sand boils up occasionally, but not so much as a short time ago. The workmen are able to stay at the bottom of the shaft and are not greatly troubled by water or sand. That the hundreds of tons' weight of shaft and timbers, loaded as they are with iron does not sink fast is a remarkable thing. A bed of clay will soon be reached. The old Negaunee mine is now shipping as fast as possible, and will make a record-breaking output this year, considering the obstacles encountered lately. The volume of ore shipments from Negaunee and Ishpeming is very large, heavier than at the corresponding date after opening of navigation last year. Considerable ore is going through to Escanaba. At the Volunteer mine, Cascade range, which was taken not long ago by the Union Steel Co., about 150 tons of ore is being raised daily, and this will increase gradually. The same company is also doing work at other points nearby. On the western Marquette, in the vicinity of the American and Dexter mines, much work is in progress and contemplation, and several of the old mines will be pumped out, examined carefully and probably reopened and developed extensively.

In the Iron river district of the Menominee range, Duluth parties are working near the Hiawatha mine and are making considerable progress, with some excellent indications. The Hiawatha mine itself is making a fairly large output and will be developed considerably this year. At the Mansfield the sinking of the new shaft in diorite is a very slow, hard job. The twelfth level is being opened, and when the new shaft is ready for business the mine can be a large producer. The old shaft will be sunk another level at once. At the James property the shaft is down 375 ft. It will be carried to more than 300 ft., and drifting will be undertaken. The shaft has been sunk at the rate of 3 ft. a day for some weeks. The Fogarty land near Iron river has been examined this week by agents of the Cleveland interest and may be taken for exploration. Shafts are being put down on the Caspian and Kinney properties and machinery plants are being installed at both places.

Engineers are starting in the work of preliminary surveys for the Nipigon Railway, a Canadian line heavily assisted by the government and designed to run up the east side of Nipigon river from Lake Superior to Lake Nipigon, about 80 miles, and thence northeasterly to Albany river. It will cut across the region where most of the large steel making interests of the continent that carry on explorations have had agents and experts for the past year or two. The Oliver Iron Mining Co. had confidential men in this region three years ago. The road is being built under a concession to a paper and pulp concern, but will be available, of course, in case iron is found there. Much in the way of floating indications has been found, but little else, so far.

TORPEDO BOAT DESTROYER STEWART LAUNCHED.

The torpedo boat destroyer Stewart was launched from the yard of her builders, the Gas Engine & Power Co. and Charles L. Seabury & Co., Consolidated, Morris Heights, N. Y., on Saturday last. The Stewart was named by Miss Frances Rodney Stewart of Newark, N. J., a granddaughter of Admiral Charles Stewart for whom the vessel is named. The principal details of the Stewart follow: Length on normal load waterline, 254 ft.; beam normal load waterline, 23 ft.; displacement on trial, about 420 tons. The machinery is of a high type of marine manufacture. The main engines are of the four cylinder, triple-expansion, balance type, and the boilers are what is known as the express type, designed by Mr. Seabury especially for the Stewart. The four boilers in the Stewart are designed to develop 8,000 H.P., and are calculated to give the vessel a speed of a little over 29 knots for two consecutive hours. The hull is constructed of high class steel throughout, and with the exception of the officers' and crew's quarters contains no wood, and that used is fireproof. The ordnance will consist of several high power rapid-fire guns and two torpedo tubes, and complete air plant supplying air power necessary for their discharging. The preliminary trials will be started in about two months, and the vessel will probably be ready for commission about October. Admiral Charles Stewart was born in Philadelphia. He was captain of the Constitution, which was originally built for the purpose of destroying pirates, and in the war of 1812 he was made admiral. Under the command of Admiral Stewart the Constitution, which was not well adapted for the purposes of war, scored some remarkable victories, among them being the capture of the Levant and the Cyanne, which was accomplished in forty minutes.

In asking a vote of $100,000 for Quebec harbor, J. I. Tarte, minister of railways and canals, said in the house of commons last week that the vote was part of $1,000,000 which will complete the scheme planned with a view to making Quebec the harbor for the fast Atlantic line, which he expected would soon be established. He did not think Quebec would be a great wheat shipping port. In summer wheat would go from Montreal; in winter from St. John, from which port 2,000,000 bushels of wheat had been shipped last year.

OCEAN AMBULANCES.

A writer of one of the London newspapers thus discusses a new plan of ocean patrol to minimize the dangers of the sea which would seem to have many considerations to commend it:

The word "missing" is prominent in the shipping annals of late. The mysterious evanishment of the Condor and Huronian has not alone set people musing upon the perils of the deep. There are at the present time fifteen other vessels posted at Lloyd's, and the heavy extra rates which are being asked upon them all by underwriters are perhaps the most significant testimony of their fate. It may be argued that the dangers of the sea can never be to any appreciable extent provided against. The menace of the leeshore is largely neutralized upon our own coasts by the heroic and efficient life boat service. That modern delusive averter of the evils of collision, the water-tight bulkhead, may, indeed, enable the owner to insure at higher rates, but how often does it save a ship? Steam is a factor which undoubtedly has added to the security of the mariners' calling, yet there are innumerable instances in which it has proved a source of peril undreamed of in the days of tacks and sheets.

And beyond this, what are the conditions of the sea life as lived not so much on board the palatial liner as upon the teeming ocean tramp? Are they superior to what they were in the time of Marryat, so far, I mean, as science has lessened the sailor's risk of getting drowned?

The theme is one which has occupied the minds of men, although it has thus far been productive of but small practical fruits. To combat the stormy ocean is no mean undertaking, as Dame Partington discovered when she attempted the task with her broom; and as Mr. Bush concluded when he gave over striving to subdue the Goodwin Sands. But there lies before me as I write a little pamphlet dealing with this subject, and detailing a plan which appears at once so feasible and so meritorious that I confess I view the obligation of carrying it out almost in the light of a national duty. The title of the slender budget is as follows: "Scheme for an International Blue Cross Ocean Life and Salvage Service," and it is compiled by Mr. Henry Forton Craggs, a member of a well-known firm of Middlesbrough ship builders.

The author assuredly establishes his claim to speak upon this subject with all the authority to be gotten out of long experience when he tells us: "I have been for half a century, ashore and afloat, practically engaged with ships, both sailing and steam—designing, building, and sailing wood, iron, and steel vessels. I have stood many a 'gravy eye trick,' and hauled out many a reef-earing."

To anchor such vessels in fixed stations, with soundings running into thousands of fathoms, would be obviously impossible. Nor would the ocean life boats be in a position to most effectively render aid if they lay hopelessly moored. Mr. Craggs' idea is that the latitude and longitude for each upon her station be fixed, within which limits each shall cruise for a specified time, particulars of these positions and dates being punctually announced in all marine almanacs, so that it may always be known approximately where a Blue Cross vessel can be found.

Briefly, the salient points of Mr. Craggs' comprehensive scheme are the establishment, at certain intervals, along the most frequented of the watery highways of ocean steam life boats, of a type specially designed to withstand the stress of all weathers. The purpose of this fleet is sufficiently implied by the character of the vessels forming it. To enhance the utility of this project it must necessarily be international, and as it would make for the benefit of all sea-going races it is inconceivable that any civilized country would hesitate to acquiesce in the scheme.

The service is designed to be, in its relation to the mariners' vocation, practically upon the same footing as that for which the Red Cross is emblematic in the army. Its primary mission would consist of rendering aid to distressed vessels, and rescuing shipwrecked sailors. But beyond this the functions of floating hospitals and mission stations might be admirably discharged by the little craft.

"And I believe," adds this ingenious sailor, "were it known to seamen that on a given date one of the life boats would be within sight of a fixed latitude and longitude, many crippled ships, and crews who have had to abandon ships in their boats, would be saved and accounted for, that now, alas! we only hear of as 'missing.'"

A forecast which carries peculiar significance in its appeal at the present moment, the names of the Condor and Huronian still lingering pregnant with mystery and disaster in the public mind.

It needs not that I should do more than broadly indicate the character of Mr. Craggs' scheme in order to enable anybody with the most rudimentary knowledge of maritime affairs to immediately perceive the immense blessing it would prove to the ocean-borne world. No necessity for me to go into the technical details of these steam life boats and their equipment. The originator of the Blue Cross project suggests that the number of life boats and of cruising stations should be fixed by an international board, representing the nations who adopt the scheme, each nation being represented in proportion to its shipping tonnage. Which last point naturally brings us to the consideration of who would defray the cost of this world-wide cordon, girding all the trackless blue highways, with the necessary adjuncts of supply steamers continuously visiting them to replace stores and relieve the crews. But Mr. Craggs has not overlooked this aspect of the matter so comprehensive has he been in evolving his admirable scheme. He not only demonstrates that it can be done, but he tells us on commercial lines how to do it. Starting with the premise that the loss of life and property is a national disaster, he naturally at once puts the matter upon a basis which must indirectly concern all classes in this maritime kingdom. He boldly announces he anticipates that species of opposition which is bred of apprehension for the pocket, and he is beforehand with this objection by providing against the existence of it. No rates, taxes, levies, or tolls form any part of the Blue Cross scheme. On the contrary, the prospect of a lucrative investment is held out in connection with it. And, remembering that the originator of the whole project is himself a prominent man in the important industry of ship building, with a clear, practical knowledge of all features of the sea calling, one would be chary in saying that any detail of this well-thought-out pamphlet is either sanguine or improbable.

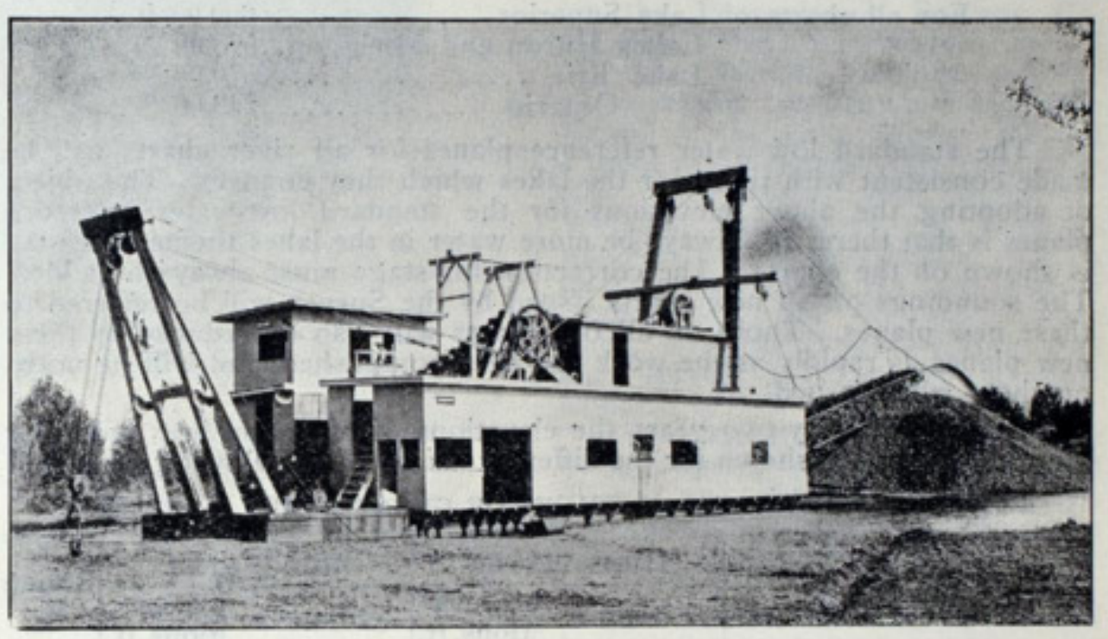
Loss of property at sea manifestly means loss of money. The saving of vessels which are in jeopardy of being lost forms a well-defined business, inasmuch as it already maintains several prosperous salvage companies. Large sums of money are paid for the salvage of vessels, as may be gathered from the fact that the average awards of the admiralty court run to nearly one-third the value of the ship and her freight.

Let Mr. Craggs put forward his own ideas for the financing of his scheme.

"The cost of the service," he writes, "which should include an insurance and superannuation fund, should be apportioned among the nations served in proportion to their shipping tonnage. . . . All salvage of ships or cargoes to go to government account, and to be credited to the service. I estimate that ten life boats and one store boat would serve the North Atlantic, and that this fleet would cost £275,000. This fleet would be sufficient not only to establish the value of the work, but the need for its extension to other ocean tracks. I think the sum of say, £300,000 could be raised by an issue of Blue Cross 2½ per cent. consols." The interest on this issue could be paid, and the working expenses of the life boat fleet provided for, Mr. Craggs computes, by the earnings from salvage and special awards. As to who would subscribe the capital, one might safely wager that marine insurance underwriters would see to that. Be this as it may, the conception is a most practicable and beneficent one; and while it is characteristic that it should come from a British sailor, it would be fitting that the great international scheme for the welfare of all who go down to the sea in ships should be established by the first maritime power in the world.

GOLD DREDGES OPERATED BY ELECTRIC MOTORS.

Gold dredges operated by electric motors are doing much to reclaim the enormous wealth of gold lost by the wasteful methods of early placer mining. The Bucyrus Gold Dredging Co. has recently purchased from the Westinghouse Electric & Manufacturing Co. of Pittsburgh a large amount of electrical machinery for the operation of its dredges in California. The chief point of activity in California, at the present time, is on the Feather river at Oroville. In early mining days in California the Feather river was the scene of great activity in placer mining, many million dollars worth of gold being taken out of Feather river canyon. A great deal of this gold, owing to primitive methods of handling, was not saved and was deposited with the "slickens" on the flats at the mouth of the canyon, below Oroville. An area of about 10,000 acres is now being partially worked over by gold dredges. Hydraulic mining having been



prohibited and the bed rock being found at a great depth, the only feasible method of lifting this gold bearing gravel from the bed of the river or old channels is by the dredging process of mining. The profits of operation have frequently been $1,000 per dredge daily. Each dredger costs from $40,000 to $75,000, depending on its capacity. The operation of the dredge is accomplished entirely by electric motors, the current for which is obtained from long distance transmission companies, operating in this neighborhood. Transformers are usually placed upon the bank to lower the voltage of long distance lines and flexible cables from the bank to the top of the dredge, and from there to the various motors. There are usually installed motors of an aggregate capacity of 75 H.P. to 200 H.P. on each dredge. A variable-speed Westinghouse induction motor drives a counter-shaft from which the main dredging buckets are operated. These buckets raise the material from the bed of the river to the shaking screens on the top of the dredge.

TO MAKE FOUNDRY IRON.

One hundred acres of land, occupying the lake front at South Buffalo, adjoining the Lackawanna Steel Co.'s site on the city side and extending to the frontage owned by the Pennsylvania Railroad Co., are under option by Frank H. Goodyear, S. W. Goodyear and William A. Rogers. In regard to fifty acres of this 100 acres, Mr. Rogers of the firm of Rogers, Brown & Co., has issued the following statement:

"William A. Rogers of Rogers, Brown & Co., and F. H. & C. W. Goodyear are proposing to build in Buffalo two large, modern blast furnaces for the manufacture of foundry pig iron. An option has been secured on about fifty acres of land in the vicinity of the Stony Point steel plant, which will no doubt be chosen as the site. It is expected that each of the furnaces will produce about 400 tons of pig iron per day. The officers as so far arranged are: W. A. Rogers, president; Frank H. Goodyear, first vice-president; Charles W. Goodyear, second vice-president. The ownership is equally divided between the Goodyear firm and Mr. Rogers. It is expected that work will be begun during the summer and completed within the following eighteen months or two years. The company will have its own ore properties in the Lake Superior district and coal mines of coking coal in Pennsylvania. The capital to be employed in the furnace plant, ore mines and coal operations is $3,000,000.

The motor department of the Johnson Works of the Lorain Steel Co.'s plant at Johnstown has been sold to the Westinghouse Electrical Manufacturing Co. of Pittsburgh.

WORK OF LAKE SURVEY OFFICIALS.

Major W. L. Fisk of Detroit, engineer in charge of the United States Lake Survey, contributes the following interesting account of the work of his office to the 1902 edition of the directory issued by the Ship Masters' Association:

The duties of the United States Lake Survey in addition to the publication and issue of charts are the making of surveys for keeping these charts corrected to date, the maintaining of a system of water gages which give continuous records of the stage of water, and the investigation of the causes affecting the changes in the elevations of the lakes.

In connection with its work, the Lake Survey is publishing in colors entirely new charts of many of the harbors upon the great lakes, and expects to continue until all have been similarly charted. In addition the old charts are being brought up to date as rapidly as possible and reissued in colors, which work will be continued until eventually all charts will be colored. The special value of the new charts is that the blue color at a glance shows all water less than 18 ft. in depth. From Jan. 1, 1901, to April 1, 1902, new charts and revisions of old ones to the total number of twenty-seven have been issued in colors.

A matter of special importance in the use of charts is a knowledge of the prevailing stage of water in the area covered by the chart being used. The Survey publishes early each month in the daily and marine papers the mean stage of each lake, as given by its water-gage records of the previous month. This mean stage compared with the stage to which the soundings on any of the charts are reduced will give the correction to be applied to obtain the prevailing depths of water. To simplify the making of this correction to all new charts, that is those on which the soundings have been reduced to the new standard low-water reference planes—all of which will have a note on them calling attention to the matter—the Survey will inaugurate during the coming season and maintain in the future a system of automatic gage indicators, the readings of which will be the amount, in feet and tenths, to be added to the soundings on these news charts. One of these indicators will eventually be found at all of the principal harbors and at all important points along the rivers.

The standard low-water lake surface or reference planes adopted for the new charts to which all future soundings will be reduced are:

Feet above mean sea level.

For all charts of Lake Superior	600.00 ft.
" " " " Lakes Huron and Michigan	578.00 "
" " " " Lake Erie	570.00 "
" " " " " Ontario	243.00 "

The standard low-water reference planes for all river charts will be made consistent with those for the lakes which they connect. The object of adopting the above elevations for the standard low-water reference planes is that there will always be more water in the lakes themselves than is shown on the charts. The correction for stage must always be added. The soundings on all new charts issued by the Survey will be referred to these new planes. Those on all old charts will also be reduced to these new planes as rapidly as the work can be accomplished, and will be noted on them when issued.

In the last forty-two years the elevations of high and low water for monthly stages are shown for the different lakes in the following table:

EXTREME MONTHLY MEAN STAGES OF GREAT LAKES SINCE 1860.

Lake	High Water		Low Water		Range ft.
	Date	Elevations, ft.	Date	Elevations, ft.	
Superior	Sept., 1869	603.63	Mar., 1880	600.19	3.44
Michigan and Huron	Feb., 1876	583.15	Dec., 1895	578.58	4.57
Erie	June, 1876	574.61	Nov., 1895	570.79	3.82
Ontario	May, 1870	249.04	Nov., 1895	243.50	5.54

The water gages on the different lakes for March, 1902, indicate the following conditions:

STAGES OF WATER AT OPENING OF NAVIGATION, 1902.

Lake	Elevation	Above standard low water plane in feet
Superior	601.41	1.41
Michigan and Huron	579.28	1.28
Erie	571.04	1.04
Ontario	245.0	2.0

The Lake Survey is continuously sweeping lake areas where shoals are suspected to exist, and masters are requested to communicate the discovery of any new shoals to Major W. L. Fisk, United States Lake Survey office, Detroit, giving as accurate a description of location as practicable, draught of vessel and date. All such reported dangers will be examined and charted at the earliest date possible.

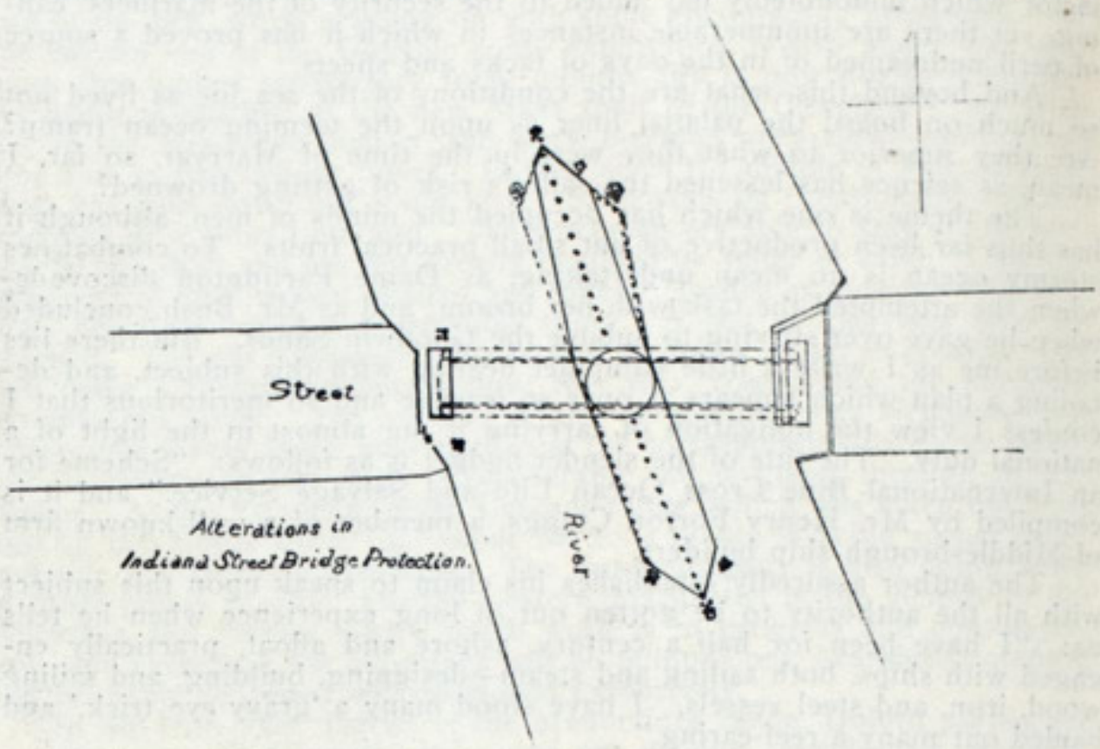
Of course, the object in view in eventually reducing all charts to the new standard low-water planes is to have always at least the depth shown by the chart, and as much more as the reading of the gauge for that locality, and the intention has been to take the planes low enough so that the chart user may always have the same thing to do with his gauge reading—that is add it to the soundings shown. Had higher planes been adopted it would have been necessary to some times add and some times subtract the gauge reading.

The five-masted ship Preussen, said to be the largest sailing ship in the world, was launched at Geestemunde this month. She is of 8,000 tons deadweight capacity. The largest sailing vessel heretofore known was the German five-masted ship Petosi.

The new tug boat John G. Chandler for the Commercial Towboat Co. of Boston was successfully launched last week from the yard of the Kelley, Spear Co., Bath, Me. The tug will cost, when completed, $40,000.

CHANGES ON CHICAGO RIVER.

Chicago, May 14.—A change, slight in itself, but important to the owners of large vessels on the lakes, has just been made in the north branch of the Chicago river. Incidentally it shows the energy of the management of the Ship Owners Dry Dock Co. and is therefore interesting from both points of view. The Ship Owners bid on overhauling the steamer Mauch Chunk, recently; they were told that their bid was good, but that the vessel was too wide to get to their yard on the north branch. They replied that they would get her there and were given the contract. She measures 50 ft. beam and has a 9-in. wale strake outside of that, making a total width of 51 ft. 6 in. Indiana street crosses the river at an angle and the abutments and bridge protection are placed at right angles with the street instead of being parallel with the banks of the river. One draw is narrower than the other, and the widest opening from the piles protecting the abutment to the bridge protection was 49 ft. A survey



showed that by pulling up the piles and taking off a portion of the pier on the north end an opening of 55 ft. clear could be made. The city had no money with which to do the work and the Ship Owners Dry Dock Co. did it themselves, thus getting the Mauch Chunk to their yard for overhauling. The vessel is now in the new dry dock.

This opens the north branch to vessels of 50 ft. beam and 16 ft. 6 in. draught, something that the owners of such craft will be glad to hear, as there are numerous coal docks, grain elevators, lumber yards and ore docks on the north branch which have been heretofore obliged to depend upon the smaller vessels.

The accompanying sketch shows the nature of the work performed on the bridge protection. The dotted lines show that part which was cut off from the west draw and added to the other side, making the protection irregular in shape but permitting the passage of the 50-footers. To draw and replace the piles, stringers and ties took nearly a week and the company is entitled to considerable credit for the determination and energy displayed.

AROUND THE GREAT LAKES.

Grain trimmers at South Chicago have advanced the trimming rate from 65 to 75 cents per 1,000 bushels.

The steamer L. C. Smith, built for the United States Transportation Co., of which Capt. W. W. Brown of Cleveland is manager, was launched Wednesday at West Bay City. The new steamer is of the 5,000 ton kind, similar in nearly all respects to several other large freighters which the American company has built of late for Capt. Brown and his associates.

On Saturday of this week the Eastern States, first of the big side-wheel steamers for the Detroit and Buffalo line, will be given a trial by the Detroit Ship Building Co., and it is expected that she will be in readiness to inaugurate the Detroit-Buffalo service on Monday, June 2. The second steamer, Western States, will be ready about a week later.

The new steel passenger steamer Columbia for the Detroit, Belle Isle & Windsor Ferry Co. was launched last Saturday at the Wyandotte yards of the Detroit Ship Building Co. When completed the Columbia will be placed on the route between Detroit, Bois Blanc island and Amherstburg. She is 216 ft. in length over all, 200 ft. keel and will carry 3,200 excursionists.

Gage records of the United States lake survey show the following mean stages of water for April, above mean sea level: Lake Superior, 601.46 ft.; Lakes Huron and Michigan, 579.47 ft.; Lake Erie, 571.58 ft. These stages show Lake Superior to have been 0.20 ft. lower than during same month last year, and 0.01 ft. higher than in April, 1895; Lakes Huron and Michigan were 0.62 ft. lower than during same month last year, and 0.07 ft. lower than during April, 1895; Lake Erie was 0.20 ft. higher than during same month last year, and 0.23 ft. higher than during April, 1895.

Capt. R. Jollie of the steamer John Ericsson has made the following suggestion in a letter to the hydrographic office: "I would suggest that the woods back of the Bernard ranges be removed. There is no time in the forenoon that they can be seen coming down from Point Iroquois until very near the can buoy at the turn, and it is very hard to locate them. If the woods were cut down it would leave a gap, and steamers coming down could right themselves by steering for it. It would be a great help to everybody. The ranges above mentioned are located above Round island, Waiska bay, Lake Superior, and are a guide out to and from Point Iroquois."

Mr. Lewis Nixon has resigned as the head of Tammany Hall and says that hereafter he will devote his entire attention to ship building.

THE DEATH OF PATRICK SMITH.

Patrick Smith, one of the most progressive and picturesque characters on the whole chain of lakes, has passed away as a result of an accident. While driving home along the Superior street viaduct in Cleveland on Wednesday of last week his vehicle was struck by a street car. The injuries which he received would not be considered serious ordinarily, but owing to his great age he was unable to rally from the shock. Patrick Smith might truly be considered one of the pioneers of Cleveland, or of the great lakes region for that matter, as there was little development of either when he came to this country from Ireland in 1836. He was born in 1827 and when nine years old his mother brought him to this country to join his father, who had settled on a farm at Independence, near Cleveland, a few years previously. The lad was sent to the village school and spent his spare time working on the farm with his father and around the eight-mile lock and canal near Independence. Subsequently the family moved into Cleveland and took up a residence on Front street where the gas house is now. The family later lived on Spring street and on Bond street and later yet on the corner of Erie and St. Clair streets. Mr. Smith assisted his father in the humble employment of peddling milk and then engaged in the general teaming business. Having grown to man's estate he married Miss Margaret Olwell and moved to Pittsburgh street, where he bought a house and lot from Joseph Stanley who was identified with the street railway interests of the city. His house occupied the space between that of Joseph Stanley and Charles Barkwell. He then engaged in the brick business, which he continued until 1865.

It was just upon the cessation of the war that Mr. Smith purchased a pile driver from the United States government and started out upon what was to be his life work. He drove piling for the general government and for the city and private interests. From this modest beginning his maritime interests grew until he became the principal constructive figure in the harbors of Lake Erie. It used to be said indeed that Pat Smith owned the Cuyahoga river. The Cuyahoga river of the early days was an entirely different stream from the present deep channel. The head of navigation was at Superior street. The river was extremely shallow and Mr. Smith saw that before it could attain any navigable importance whatever it would have to be dredged. Such a thing as a steam dredge was unknown. Mr. Smith rigged up a dredging machine which was operated by horses. The horses wound a rope about the capstan and in that manner elevated the scoop. He dredged the river from its mouth to Superior street for years with this cumbersome apparatus. The scows were towed by hand along the wharf, a process which was sometimes assisted by poling. When the mouth of the river was reached the scows were pushed by poles out of the channel and dumped, and then pulled back by means of ropes. Later in life Mr. Smith said that the songs of the sailors heaving on the capstans of his dredges could on still nights be heard as far as Erie street. The first steam dredge on Lake Erie was built by Mr. Smith at Cleveland. From his experience as a dredging contractor he saw the possibilities of the towing business and entered into it most extensively. His fleet of tugs was accounted the best on the lakes. In fact his river equipment was his pride and it seemed almost impossible for him to satisfy himself on this score. He was forever and forever improving them. If he would hear of a new device, on dredge or tug in New York he would think nothing whatever of slipping out of the house after supper, and without saying a word to anyone, run down to New York to inspect the new device. He was determined that from the mechanical standpoint his outfit should not be surpassed.

PATRICK SMITH.
(From an old steel engraving.)

Mr. Smith assisted in every improvement of a public nature which had to do with the development of the river and harbor. He was an earnest advocate of the construction of the Superior street viaduct and aided greatly in obtaining the money to build that structure. He built the foundations for the viaduct. He built the water-works pumping station at the foot of Taylor street and helped to build the old reservoir on Franklin avenue. He was instrumental in getting the breakwater in front of the city of Cleveland and afterwards constructed a great deal of it. It is possible that he would have finished it had not his health failed. Mr. Smith did a great deal of work for the railroads, particularly in facilitating their entry into the city and securing for them rights of way. He built nearly all the foundations of the bridges over the Cuyahoga river for the railroads and the city. He built the railroad embankment for the Lake Shore railway from the Cuyahoga river to Waverly street. He also built the docks and reclaimed all the swamp lands on the west side of the Cuyahoga river for the Erie railway; and also built all the wharves and reclaimed all the lands on the north side of the river bed, now known as Whiskey island, for the Pennsylvania Railway Co. Mr. Smith was a very warm friend of old Mr. Linton, engineer of the Pennsylvania company, and Mr. John Newell of the Lake Shore. He did a great deal towards establishing the city water-works with John F. Whitelaw and others and acted as water-works commissioner for a number of years. He was also a councilman from the old Eighth ward, now the Twenty-eighth, and also served as a county commissioner.

He constructed pretty much all the dock property for the Lake Shore at Toledo and did all the company's dredging. He went to Ashtabula twenty-five years ago and built docks for the city of Ashtabula, the United States government and the Pennsylvania and Lake Shore railways.

Mr. Smith was of an extremely rugged nature. He was apt to call things by their proper names, and when at all stirred upon a subject was sure to strike straight from the shoulder. To those who did not understand him he seemed severe, but he really was not. He possessed a kindly, generous soul and was intensely religious. He took a deep interest in the Catholic church, but was a firm supporter of all religions and helped them as he could. He believed the influence of all religion to be good and maintained that anything that helped to uplift mankind ought to be itself helped. He took a great interest in the Bethel Association, the floating Bethel and the orphan asylums.

Mr. Smith always had the Irish cause much at heart. His father, John Smith, belonged to the party of Robert Emmet and Mr. Smith frequently said that he hoped to see the day when Ireland would be free.

He surrendered his extensive dredging and towing interests to his two sons L. P. and J. A. Smith eighteen years ago.

CENSUS BULLETIN ON SHIP BUILDING.

A bulletin issued by the census bureau on the ship building industry is a voluminous document of thirty-three large pages, containing a great many tables. The industry in the various states in which ships are constructed is discussed in an exhaustive manner. The statistics given treat of every phase of the work and show its character, growth and extent. In Virginia, for instance, the following figures are shown for the years 1900 and 1890:

Year 1900—Number of establishments, twenty-nine; capital, $14,824,884; salaried officials, clerks, etc., number ninety-three; salaries, $228,261; wage-earners, average number, 5,560; total wages, $2,523,121; miscellaneous, expenses, $224,144; cost of materials used, $2,943,317; value of products, including repairing, $6,162,962.

Year 1890—Number of establishments, seventeen; capital, $310,726; salaried officials, clerks, etc., number fifteen; salaries, $9,988; wage-earners, average number 194; total wages, $89,706; miscellaneous, $4,436; cost of material used, $83,694; value of products, including repairing, $297,000.

The report says that the capital invested in ship building on the Delaware river in 1900 was $16,756,000, and the value of the products $18,013,279. On the Chesapeake bay the capital was $19,262,193, and the value of the products $10,263,345. The figures for the Delaware river district do not include a new ship building plant of large proportions, the capital invested in which runs into the millions, but which was not in operation during the census year. The value of the ship building products of the great lakes was almost double that of Virginia and considerably larger than that of the Chesapeake bay district as a whole. It was, however, less than two-thirds of that of the Delaware river district. The capital invested in ship building on the shores of the Delaware river and of Chesapeake bay is nearly one-half of the capital invested in the industry in the United States, and the value of the products of these districts is more than three-eighths that of the whole country. There can be no doubt, in view of the above facts, that these two sections possess attractions and advantages which may in time materially help in advancing the United States to a leading position among ship building nations.

In the southern states, during the last decade, the growth in ship building was probably greater than in any other geographical division of the United States. This was due, in a large measure, to the remarkable increase made in Virginia. The capital invested increased from $4,567,860 in 1890 to $22,476,618 in 1900, or 403.1 per cent. In 1890 it constituted 16.4 per cent. of ship building capital in the United States, and in 1900, 29.1 per cent. The increase in the capital invested in ship building in the United States during the past decade amounted to $50,099,869, of which $18,008,758, or 35.9 per cent. was placed in southern ship building establishments. In 1890 the value of the products of ship building in the south was $5,485,116, or 14.4 per cent. of the total for the United States; in 1900 it was $14,905,422, or 20 per cent. of the total, showing an increase of 171.7 per cent.

A second payment of $10,000,000 has just been ordered to the syndicate which underwrote the United States Steel Corporation. This makes $20,000,000 received so far by the syndicate for putting through the amalgamation deal. The subscribers pledged themselves in the sum of $200,000,000, but as they were only called upon to advance $25,000,000, which was afterwards repaid, the sum distributed amounts to a commission of 80 per cent. on the cash paid up. It is reported that two other payments are eventually to be made.

HOW THE SHIPPING COMBINATION IS VIEWED ABROAD.

Glasgow, May 1.—It would be a pity if Americans should suppose that the people in the shipping trade of this country are as disturbed and excited as the newspapers over the Morgan shipping combine. That combination is regarded by the trade as just a pool in which, as it happens, some of the partners are in Britain and some in America. There is nothing of a national element in it. Indeed, it seems absurd to assume the probability of any of the vessels in the combine at present under the British and Belgian flags being transferred to the American flag (should congress authorize the transfer, which seems more than doubtful in its present temper) if it be true as contended by the supporters of the ship subsidy bill that it costs 30 per cent. more to operate a steamer under the American than under a foreign flag. Where would be the profit of the combine in that case? And why should the White Star and Dominion lines sink their prospective profits in a company which is to cost 30 per cent. more to manage than do their own businesses? That would indeed be a strange way to secure the reputed object of the alliance—the saving of money by the prevention of undercutting of rates. Where would be the benefit of putting up rates in order to spend the increase in extra costs? Otherwise the pool is perfectly intelligible, as is also the arrangement between the allied Anglo-American companies and the German companies, to avoid invasion of each others' preserves. The Atlantic sailing bill generally stands much in need of readjustment and with a proper understanding among all the companies in the trade there is no reason why there should not be a daily sailing, each way, all the year around. It is natural that there should be a special amount of interest taken in the affair here, because so many of the steamers concerned in the deal were built on the Clyde. The White Star boats, of course, were built at Belfast. All the Cunard boats (except one or two of the cargo carriers) were built on the Clyde, and the Cunard company is regarded as a Glasgow institution, though its offices are in Liverpool. Whether or not the Cunard company will join the combine remains to be seen. The probability at present is that it will not, but will form a working alliance with the other outside companies, not to compete in freights and fares with the Morgan combine, but to resist any possible aggressions of that organization. Besides the Cunard company there are the Anchor, the Allan and the Donaldson lines, all big participators in the North Atlantic trade, all managed in Glasgow and all outside of the Morgan combination. Besides these, there are the various large lines, hailing from London, Liverpool and other ports, such as the Johnston, the Warren, the Manchester, the Neptune, the Philadelphia-Transatlantic, the Furness, the Chesapeake, etc. All these lines have much more tonnage and command a far larger area of trade than the companies in the Morgan combine. And for continental alliances, as a set off to the Morgan alliance with the Hamburg-American and the North German Lloyd, they can co-operate with the Compagnie Transatlantique and the Danish, Italian and Austrian lines. It is said that the Holland-American line is joining hands with the Morgan combine, but this is as yet unconfirmed. Even if true there are other Dutch lines free to organize otherwise. Thus the idea of a monopoly by the Morgan combine is absurd. Indeed a monopoly of the transatlantic traffic would not be possible with capital less than ten times that of the Morgan combine ($170,000,000) if even then. It is curious how little even people connected with shipping know of the enormous magnitude of the Atlantic trade, and its ramifications and complications. As for the average newspaper writers on both sides of the ocean, they do not even know enough to conceal their own ignorance of the subject.

A point of curiosity in a practical ship building community like this is how the ships are going to be valued for the purposes of the pool.

The Leyland steamers were acquired by the Morgan syndicate last year at 50 per cent. more than anybody here would have given for them. The Merion and Haverford were built on the Clyde for the International Navigation Co. at considerably less money than that company has paid for recent additions to the fleet built in America. All the Dominion and Leyland boats are worth very much less per ton capacity than any of the White Star boats and of the White Star boats the Celtic was built when material was dearer than it is now. Moreover, the cargo carrying capacity of an enormous mail and passenger boat like the Oceanic is small compared with her tonnage and with the cargo capacity of smaller and less expensive boats of the other lines. It will be no joke adjusting all the interests in the pool. As for the profit of the trust if it has to take over all the lines at their own valuation, I would not give much for it even if I had Mr. Morgan's millions. An ocean greyhound is a short lived creature and in a very few years every one of the magnificent boats at present braving the Atlantic will be obsolete. Any millionaire anxious to throw away his millions in shipping may find any number of ready sellers of fine looking but rapidly deteriorating fleets.

As for new ships, however, we are ready to supply any amount, nor is it to be denied that the ship builders of the Clyde and of Scotland generally, would gladly welcome a few more orders just now. Aside from the 55,000 tons or so of war ship contracts for the Royal navy they did not book more than 10,000 tons of merchant craft last month. And although I say merchant craft there were really only a couple of small steamers for Dutch owners and a sailing vessel of 3,500 tons, that properly came under that designation, all the rest of the orders being for fishing vessels and special craft. During the month, however, our builders put into the water twenty-eight vessels, aggregating 46,600 tons, as compared with twenty-one vessels and 35,980 tons in March, and with twenty-three vessels and 31,200 tons in April, 1901. Of the month's output 5,750 tons was for Germany. 4,000 tons for the British colonies, 1,600 tons for Belgium, 1,300 tons for France and all the rest for British owners. As to sizes, there was one vessel of 5,000 tons, two vessels between 4,000 and 5,000 tons, four between 3,000 and 4,000 tons, three between 2,000 and 3,000 tons, five between 1,000 and 2,000 tons and the rest under 1,000 tons. I have reported during the month some of the most notable of the launches and need only now add that in the output was a four-masted sailer of 3,300 tons and a four-master of 2,450 tons both for Hamburg owners and built by A. McMillan & Co., Dumbarton, and John Reid & Co., Glasgow, respectively. The month's output brings up the total for the four months ending April to 152,660 tons. This total has never been exceeded in a corresponding period except in 1899, when the figure was 158,825 tons.

As for work in hand, the Clyde and other Scotch ship builders began the second quarter of the year with merchant orders on hand to the extent of 442,770 tons. Adding war ships then in course of construction, the admiralty contracts, and other bookings of April, and deducting the launches of the month, the total work on hand may now be estimated at about 450,000 tons. This is a big amount before us as we near the middle of the year. But then a good deal of it is in a very forward state and will be run off rapidly within the next few months. It is with regard to the work of next winter that ship builders and the trade unions are getting anxious. Apart from war ships, the total tonnage under construction in the United Kingdom is fully 120,000 tons less than at this time last year. The demand for tramp steamers seems to have entirely ceased at present and the second-hand boats are obtainable at very low prices. A renewed demand for big steel sailing vessels is not unlikely. Such vessels can sometimes be made to pay in dull times when steamers are losing hand-over-fist. It is reported that the Elder, Dempster Co. propose to make great developments in their West India service and are preparing to order several steamers much larger and faster than anything they have yet put into the trade. Some of the present West India fleet were built on the Clyde, some on the Tyne. A few days ago Alexander Stephen & Sons launched a new boat for the West African service of this company. She is named the Tarquate and measures 370 ft. in length by 44½ ft. in breadth and 26 ft. in depth. She has accommodation of the most improved tropical type for 150 passengers, and will have a speed of about 14 knots.

The Newark Castle recently launched by Barclay, Curle & Co. for the New York & Capetown South African service of the Union Castle line had a trial trip this week. She developed mean speed of 13 knots with a development of 4,400 H.P. She is arranged so as to be readily adopted to the accommodation of 300 or 400 emigrants if required, in addition to a considerable number of first and third-class passengers. In this connection I may mention that the new service of the South African combine, referred to in a previous letter, has begun. Under the Ellerman-Harrison-Clan agreement the Haddon Hall is now loading at Glasgow a general cargo for Capetown and Natal. She will be followed by a boat every ten days or so, the intention of the combine being to have thirty-six sailings in the year from the Clyde to South African ports. Mr. Ellerman has just bought three Clan line steamers, and is to put them into his Mediterranean service, while the Clan line has chartered a Dundee boat to take up a portion of their share in the South African sailings. A few days ago D. & E. Henderson & Co. launched from their Meadowside yard, Glasgow, a large steel cattle boat for the Lamport & Holt line. She measures 390 ft. in length by 50 ft. in breadth and 29½ ft. in depth, and is 4,300 tons gross. This boat, named the Terence, is especially designed for the conveyance of a large number of live cattle from South America to Liverpool and has ten powerful steam winches and large derricks at the hatches. The machinery consists of triple-expansion engines with cylinders 27½ in., 46 in. and 74 in. diameter, stroke 54 in. Steam is generated by three double-ended boilers at a working pressure of 210 lbs. There is also accommodation for passengers as well as for cattle.

The Canadian Pacific Railway Co. have ordered from C. S. Swan & Hunter, Newcastle-on-Tyne, a twin-screw 20-knot steamer, 300 ft. long, to run between Vancouver, B. C., and Victoria on Vancouver island. There is to be accommodation for 160 cabin passengers and also for a large number of deck and Chinese passengers.

ON A TOUR OF INSPECTION.

The general tour of inspection now being made by President Schwab and other officials of the United States Steel Corporation will, in all probability, finally determine the manner in which the $50,000,000 new cash raised for improvements and additions will be disbursed. It is unlikely that the plans that have been drawn by the engineers of the subsidiary companies will be materially changed. The only question of importance that has not been definitely settled is the points of location of certain new plants that the corporation will construct. It is understood that considerable doubt will develop as to whether Conneaut will benefit through the additions contemplated by the United States Steel Corporation.

Included in the party making a tour of inspection of the properties are the following officials: Charles M. Schwab, president; James Gayley, first vice-president; W. B. Dickson, second vice-president; Veryl Preston, third vice-president; Joseph E. Schwab, assistant to the president; George G. McMurtry, president of the American Sheet Steel Co.; W. T. Graham, president of the American Tin Plate Co.; W. P. Palmer, president of the American Steel & Wire Co.; A. J. Major, president of the American Bridge Co.; P. W. Moen, vice-president of the American Steel & Wire Co.; W. E. Corey, president of the Carnegie and National Steel and the American Steel Hoop companies; Frank J. Hearne, president of the National Tube Co.; Judge E. J. Buffington of Chicago, president of the Illinois Steel Co.; D. M. Clemson, president of the Pittsburgh Steamship Co., and D. G. Kerr, manager of the ore interests of the corporation.

Considerable interest was manifested in a report from Boston that if the present plan for the retirement of $200,000,000 preferred stock for a similar amount of bonds of the United States Steel Corporation is a success, the remaining preferred stock, amounting to over $300,000,000 would be retired on the same basis, thus leaving only one class of stock. It was stated that if $50,000,000 more cash was paid in with the retirement of the remaining shares the Steel Corporation would have something like $150,000,000 cash in its treasury. Financiers in close touch with the United States Steel Corporation said that eventually all the preferred stock of the combine would be converted into bonds, but that any statement on the question would be too premature to warrant discussion, as it was an undertaking of the very far future.

The Dunderland Iron Ore Co., of London has been formed with a capital stock of $2,000,000 to work extensive deposits of iron ore in Norway by means of the Edison process. The chairman of the company is Sir David Dale, managing director of the great Pease firm, whose word is really as acceptable in the north of England as a Bank of England note.

The building of large war ships at government navy yards is impracticable and inadvisable according to Rear Admiral Francis T. Bowles, chief constructor, who has sent a communication to the house naval committee upon the subject.

OUR NEW NAVY.

Rear-Admiral George Wallace Melville contributes to the current issue of the Review of Reviews a very interesting article upon the subject "Our New Navy." No authority stands higher than the engineer-in-chief of the United States navy and no man has had a longer or more honorable public career. Following are excerpts from the article:

"In measuring the value of a navy, account should be taken of the direct and indirect benefits accruing from its existence. It is worth something to a nation to possess a weapon that can be quickly used, either at home or abroad, for restraining disorder or for averting war. It makes for the nation's dignity and prestige to possess a service whose traditions and customs instill honor and self-respect in its members, and whose officers represent, in their conduct and work, the best thought and aspirations of the country at large. It is because the great value of a navy to a nation in warding off evil can never be determined that the full realization and significance for its existence will never be appreciated, except by some such isolated country as Great Britain. The British empire is the only power that fully realizes the fact that to preserve a nation's prestige and integrity there must be maintained a navy strong enough to protect its own coast and commerce, while also sufficiently large to attack at the same time any possible ally of her enemy. Every dominant world power for over 2,000 years has aimed to control the highways of the ocean. There is an inspiration and glory in possessing sea-power that makes any holder loth to lose control of the great lanes of commerce. Once let a nation reap the glory of a Trafalgar or Santiago, or secure the carrying trade of the world, and you raise a race who will eventually make the sea the home of its adoption. This country has had a taste several times of the sweets of a sea-power, and, on this account, the rehabilitation of the navy has appealed so strongly to public sentiment that the question is neither a political nor sectional one. Only, however, in the past century has anything like full recognition been given to the work of a navy in the great movements that have determined which nations shall mold human destiny.

"It has been maintained by some experts that our sphere of influence should be confined to the protection of our own coast. Such a policy may be applicable for hermit nations; but manufacturing countries must have ships to carry their wares to distant seas, and where the merchantman goes, the man-of-war must be kept in readiness to follow. Self-preservation compels industrial nations to trend toward becoming world powers. In the carrying of goods to the shores of colonial possessions, one may often pass the boundaries of possible foes, and, therefore, one's navy must be powerful enough to keep clear the lane between country and colony. As it takes five years to build a battleship, and as we have fewer of these fighting machines than almost any other great power, it will be some time before we shall have a navy adequate to our needs and necessities. A policy of construction and action should be outlined, and, therefore, the question of the navy's requirements should be met and not evaded by naval experts.

"The race for naval supremacy is well on, and it will be continued until some of the countries are pretty nigh bankrupt in the effort to become powerful on the sea. Either by trend of events or for self-preservation, some nations have been forced into this race against the protest of wise and experienced statesmen. There are two factors, however, which will narrow this contest for supremacy to three powers:

"First—The expense of creating and maintaining a navy. The naval expenditures of several countries have increased threefold during the past fifteen years, and already the naval budget of one nation exceeds $100,000,000. With such expenditures a nation with the deepest pocketbook must have a great advantage.

"Second—The difficulty of securing men for the warships. The only man who can do good work afloat is one who has aptitude for the sea, and a nation which does not possess either a powerful maritime marine, or does not systematically develop a large and efficient training system, can never hope to become a sea power.

"In measuring naval strength, that country will be the ultimate stronger naval power which can turn out a battleship most rapidly, and which has the most establishments capable of undertaking this work. Speed in construction is, therefore, a factor that must be taken into consideration. We have at least ten ship yards that are ready to take a contract for a battleship when they find it profitable to do so, and within two years it is likely that three more will be in condition to do the work. We have two plants that can make armor, and if our building program will be sufficiently large, a third firm is ready to go into business. Measured from the standpoint of speed construction, we are only surpassed in naval strength by England. The ship yard is an element of naval strength, and the fact is becoming more recognized each day. An armor plant is as valuable as a gun foundry, and a dock is necessary to the efficiency of a fleet.

"Our ships can only be considered the equals of those of other nations. In a few special respects they may be the superior; but it must be remembered that wherever these battleships are designed, the local vessel is made out to be the superior. Such would naturally be the case, as different experts attach different values to the several factors that are considered in the design of a warship. In designing these fighting machines, there are many questions that affect their efficiency, such as ammunition and coal supply; character and distribution of both battery and armor; mean draught, speed and total displacement. A change in any one of these factors may necessitate changes in all others, and thus each nation would naturally develop a type of warship that would best meet its special requirements. Measured from the standpoint of each nation's resources and necessities, every naval power has probably settled upon a type that best answers its purposes. It is possible that, in seeking superiority in special respects, a naval architect may attach importance to factors which time may show to be valueless for even the particular purposes intened.

"Considering the fact that the general plans of a warship are accessible to hundreds of observing and intelligent persons, no nation can keep from the knowledge of possible enemies any military invention that will increase the efficiency of the fighting vessel. Probably the only secret that can be jealously guarded for a time is the composition and manufacture of gunpowder and high explosives. As it may be regarded as a good rule to consider the last battleship whenever designed as the best, all nations possess antiquated, as well as some excellent, vessels of the fighting-machine type. The exact science of the French; the profound thought of the German; the inventive faculty of the American, and the experience and common sense of the Briton have been exercised in designing these modern battleships. No one could be taken seriously who would maintain that any single navy possesses a fighting machine which is superior even in many respects to those built by other nations. We can well rest content in the knowledge that the character, if not the numbers of our ships, are the equal of the best possessed by the leading naval powers.

"A navy is a costly institution. Large appropriations are essential for its maintenance. From the fact that the warship contains machines crowded together, and designed to an extreme degree of lightness, depreciation of a battleship is very rapid. The design, also, soon becomes obsolete; so, altogether, it requires a heavy outlay to secure or maintain naval supremacy. The actual cost of our completed fighting vessels, and the total estimated cost of those building, will probably reach $275,000,000. This represents but a half of the actual expenditure incurred in creating a navy. In addition to the fighting ship, there are required for naval purposes numerous auxiliaries, such as dock yards, educational institutions for the training of men and officers, docks, and coaling stations. In the shape of auxiliary vessels we must have many gunboats and tugs. The collier, repair, hospital, supply, and training-ship each has a sphere of usefulness. It is the indirect outlay that swells the expenditures in the navy, as well as in the army. As an example of how excessive are the indirect expenses in time of war, it has been estimated that each soldier in the Philippines costs the army $1,500 per annum, although the pay, ration and clothing of the enlisted man will not average one-third of that amount. It costs us at least 30 per cent. more than it does any European power to build a warship. It costs us 30 per cent. more to keep our service in operation, since the expense of living is greater here than elsewhere. The minimum expense in keeping one battleship in commission cannot be less than $1,000 per day.

"I have often been asked by strong friends of the navy, if the ships are still in a state of development, and if any marked changes in design can be anticipated. The fact that the battleship must keep near a repair base shows that she is still far from being a perfect design of fighting machine. These floating fortresses are insatiable in their demands for maintenance, and it may be for the good of the peace of the world that constant repairs are required upon them. For the reason that these ships are not self-sustaining, there need be but little fear that our coast can either be blockaded or attacked. Even to blockade the French ports, a board of British admirals reported that England would have to use three battleships for every two possessed by France. No power would think of attacking our coasts without bringing into action a naval force of, at least, twice the strength of any squadron that we could assemble. It is beneath the protective deck—in the engine and boiler rooms—where the warship, working from a distant base, is at an insurmountable disadvantage. The weakness of a modern navy in this respect is known to all naval engineers, and no one has yet dared to tell in its fullness the truth as to the weakness and unreliability of this link. In the blockade of Santiago our fleet practically operated from Guantanamo and were thus able to procure coal, oil, and machine supplies from the auxiliaries that steamed to that harbor without any hindrance from the Spanish navy. The repair ship Vulcan also rendered effective service, and numerous supply ships brought fresh meat and vegetables to men and officers.

"The warship is really a less formidable fighting machine than many suppose. The steaming radius of all vessels has been overestimated. Our service has probably as good ships as other nations, and yet we have not one battleship that could steam from San Francisco to Manila and return without taking on board a deck load of coal. There will always be some lame duck in every fleet which the commander-in chief will not dare to dispense with, and this ship will retard the movement of the entire squadron. After steaming to San Juan, Porto Rico, from Key West, the commander-in-chief was compelled to return to the first-named port to refill bunkers. It will also be remembered that the flying squadron which left Key West for Santiago, to blockade that port, had hardly been off the entrance of the harbor before there was apprehension that there was a small coal supply. The fact that warships can do so little when operating distant from a base should be very comforting, so far as the protection of our coast is concerned. In the consideration of the Philippine question we shall have to labor under the disadvantage of working far from a base. The limitations in the power of the battleship that make for our advantage in the protection of our own coast, will result to our disadvantage in the defence of colonial possessions. And this is a matter that should command the thoughtful consideration of naval students. In maintaining possession of that group of islands, we shall be placed exactly in the predicament that Spain was in defending Cuba. No good coal has yet been found on those islands, and any naval power which could operate from either China or Japan would possess a great strategic advantage over us in a contest for the control of the waters of the Philippine group. Good coal is found in certain provinces of both China and Japan, and if we have to carry fuel to the Philippines we will find the task a herculean one.

"It is to the future, however, where all eyes are turned. All nations today are more concerned as to what will be than what has been concerning naval development. It is along engineering lines where special progression must take place in the future. It is exceedingly probable that in two particular directions there will be engineering advance and improvement. For over 2,000 years there has been an effort to make a practical rotary engine. The advance secured in this direction in England by the Hon. Charles A. Parsons, F. R. S., during the past twenty years has been greater than that attained since the days when the priests of Isis used a simple form of the machine to awe their devotees. The advantages for naval purposes of a successful form of steam turbine need not to be enumerated. With the advent of the marine rotary engine will come increased reliance and security of motive machinery. The machine, however, will not only have to be efficient, but possess endurance. There are many eminent engineers at work upon this problem. Even though its successful installation for commercial and naval purposes may only be secured by development, still the world can afford to pay a large sum to make the steam turbine a practical success. The two fastest torpedo boats in the world were fitted with steam turbines, and the British admiralty will install such form of motive power in one of the torpedo boats which will be laid down this year. While this great change in the form of the propelling engine is anxiously looked for, the naval engineer is also looking for a method of generating steam more rapidly and efficiently, and it is in the direction of burning liquid fuel for naval and maritime purposes that an increase in speed and steaming radius is expected.

RIVER AND HARBOR BILL.

MR. BURTON DISCUSSES MOST EXHAUSTIVELY THE ETHICS OF THE MEASURE—A VERY COMPREHENSIVE AND LUCID EXPLANATION.

Probably the most comprehensive and most lucid explanation of the river and harbor bill is that contained in the speech of Mr. T. E. Burton, chairman of the committee on rivers and harbors, delivered before the house of representatives. Mr. Burton maintains that the bill confers inestimable benefits upon our common country and upon all its people—a point of view with which we have always had the keenest sympathy. Much of a statistical nature is omitted from the transcript herein given of his remarks. Speaking of the misapprehensions regarding the bill, he says:

"The first misapprehension relates to the actual amount appropriated for the ensuing fiscal year. It has been frequently stated that this bill carries a total of sixty millions and over, to be used during the coming year. Such is not the case. The amount included in it to be expended in the fiscal year ending June 30, 1903, is a trifle over $24,000,000. In addition to that amount there are authorizations for $36,700,000. But it is no more fair to count these authorizations as a part of the appropriation in this bill than it would be to include in the annual appropriations for the army the wages of enlisted men, who enlist under provisions in that bill, for the succeeding years after the pending year for which the bill provides. It would be equally unfair to count in the postoffice appropriation bill the increased appropriations made necessary in the future by the extension of the rural free delivery service. Indeed, there is a reason which makes these authorizations less deserving of opposition by those who fear large expenses in the future, in that they are nearly all for the furtherance of commerce in places where it already exists and urgently demands larger facilities, or for the completion of projects which are already under way and upon which partial appropriations have been made for many years.

"Our experience with reference to past authorizations proves that many years will elapse before the full amount authorized herein will be expended. The act of 1890 contained authorizations for $15,622,980. Of that amount, after the lapse of nearly twelve years, there still remains $769,915. The act of 1892 authorized the expenditure of $31,760,521. Of that amount $308,000 remains unappropriated. The act of 1896 contained authorizations for the expenditure of $59,616,404. Of that amount $12,186,801, or more than 20 per cent., after a lapse of six years, remains unappropriated, and the estimates for the ensuing year under authorizations made in that act are only a trifle over $3,200,000. The act of 1899 contained authorizations for $21,666,324. After more than three years very nearly one-half of that amount, or $10,774,000, remains unexpended and unappropriated. It is probable that of the $36,700,000 authorized under this act not more than $13,000,000 will have to be appropriated for the fiscal year ending June 30, 1904, perhaps $10,000,000 for the following year, and $7,000,000 for the succeeding year. Any estimate must be based largely upon conjecture. The amount to be appropriated will depend upon the rapidity with which plans are matured, contracts made, and the work performed.

"There is another point pertaining to the amount actually appropriated, namely, that of this $24,000,000 for the fiscal year ending June 30, 1903, not more than $18,000,000 or $19,000,000 will, in the natural course of events, be expended during the ensuing fiscal year. That is due partly to the usual delays in taking up and completing work and partly to the fact that this is a biennial bill, and provisions for maintenance include two years. It is quite likely that of the $24,000,000 appropriated by this act not more than $15,000,000 will actually be expended between now and June 30, 1903. So much for the first misapprehension in regard to this bill. The second is that this bill carries much larger amounts than previous bills. Such is not the case. With some considerable care I have prepared a statement of appropriations for rivers and harbors for the fiscal years from 1879 to 1902. From this it appears that the largest river and harbor bill passed up to date was that in the year 1890, for the ensuing fiscal year, the total amount of which was $25,136,295, or more than $1,000,000 more than the amount included in this bill. The amount appropriated in the act of 1888 for the fiscal year ending June 30, 1889, was $22,397,616, or within $1,600,000 of the amount provided in this bill. But a fairer test is obtained from the appropriations for two years, as this is a biennial bill. Computed in this manner, there was appropriated for the years 1900 and 1901 something over $41,000,000. The total amount for rivers and harbors carried by the sundry civil bill for 1902, by this bill, which is for the year 1903, and the probable amount for sundry civil appropriations for continuing contracts in the ensuing year will aggregate $37,000,000 only for the years 1902 and 1903, or $4,000,000 less than for the preceding two years There is also the misapprehension that the authorizations when combined with the appropriations are greater than in any preceding year. In 1896, when expenditure exceeded revenue, and the country was in a distressed condition and ill able to bear the burdens of increased taxation, a bill was passed by this house and by the senate, and became a law, appropriating and authorizing $72,000,000, or nearly $12,000,000 more than the appropriations and authorizations in this bill. There is another misapprehension to which, in the third place, I wish to call attention. I refer to the prevalent idea that appropriations for rivers and harbors are increasing more rapidly than other appropriations of the government. The facts are exactly the contrary. The amount appropriated in 1879 for rivers and harbors was $8,201,700. The average amount for 1901 and 1902 was $11,616,115, or an increase of 42 per cent. over 1879; or, if we take the average of the two successive years having the greatest appropriation, those in the sundry civil bill included, 1900 and 1901, the increase is from $8,201,700 to $20,697,822, or 152 per cent. Now, let us take up for comparison, first, the postoffice, which is most in touch with the business development of the country and which can most naturally be compared with river and harbor appropriations. The amount appropriated for the fiscal year 1879 was $33,256,373; for 1902, $123,782,688, or an increase of 272 per cent. as compared with 152 per cent. increase in river and harbor appropriations, by comparison with the two years of maximum expenditure in the latter. Let us next compare the navy. That increased from $14,152,603 in 1879 to $78,101,791 for the fiscal year ending 1902, or an increase of 451 per cent. Let us next take up the army. The increase in that is from $25,593,486 for the year 1879 to $115,784,049 for the year 1902, or an increase of 352 per cent. The largest increase in any of the appropriation bills is that for fortifications. The amount carried in the bill for 1879 was $275,000. In the bill for 1902 there is an appropriation of $7,364,011, or an increase of 2,577 per cent., as compared with the year 1879.

"We have, according to statements which I am presenting to you, an increase of 42 per cent. under the most favorable comparison for rivers and harbors and 152 per cent. for the least favorable, against 272 per cent. for the postoffice, 352 per cent. for the army, 451 per cent. for the navy, 1,709 per cent. for agriculture, and 2,577 per cent. for fortifications. The total amount appropriated in the last four years for river and harbor improvements was about $63,000,000; for the navy—one branch merely of the military service—the total appropriations were $247,000,000, nearly four times as great; and yet there are many persons in the country who criticize this bill because of its extravagance, who uttered no sound against the appropriation of four times as much for merely one branch of our military establishment.

LITTLE BEING SPENT ON MINOR STREAMS.

"I desire to take up also a criticism familiar to some of you, that river and harbor bills, not only this bill, but other bills in past years, have carried an inordinate amount for the improvement of insignificant streams and creeks in the country. This criticism has gained very general credence. There is not a socialist, not a superficial critic of government appropriations, but he is prone to compare this bill in its appropriations for minor streams with those for the great commercial ports, and rivers of the country, and say that the latter are neglected, while the former absorb the appropriations in the bill. Now, let us see how much truth there is in this. I think it will be conceded by all that when a waterway has a tonnage of over 100,000 per annum it is worthy of attention and of the fostering care of the government. I think it will be again conceded that when the value of commerce on a waterway exceeds $1,000,000 per annum it is taken out of the category of streams which are insignificant. The total number of streams having a tonnage of less than 50,000 tons is thirty-five. The aggregate amount to be expended for them is $214,100 for the next two years. The total tonnage of these streams is 619,105. The number having a tonnage of between 50,000 and 100,000 is twenty-four, for which there is included in this bill $202,900. According to the latest statistics, the volume of commerce upon them in one year was 1,671,263 tons. So it seems that appropriations aggregating $417,000 for two years, or $208,500 per annum, will provide for an annual traffic amounting to 2,290,368 tons, at a cost to the government of between 9 and 10 cents a ton.

"The interstate commerce commission has prepared, at my request, a statement of the tonnage on certain of the minor railroads of the country. I selected at random sixteen railways, the shortest of which has a mileage of 11.78 miles and the longest of 253.7 miles, and found that of these eight had a tonnage of less than 100,000 per annum, varying from 3,310 tons on one railway having a length of 44 miles to 59,146 tons on one having a mileage of 86 miles, and if we select the one having the largest tonnage on a short mileage, 98,000 tons on a railroad having a mileage of 11.78 miles. Yet it will appear that each one of these railroads is capitalized for a very considerable sum. The following is a list of them:

MILEAGE AND TONNAGE FOR THE YEAR ENDING JUNE 30, 1901.

Name of Road.	Miles operated.	Tons carried.	Tons carried 1 mile.
Clarendon & Pittsford	11.78	98,586	443,637
Buffalo, Attica & Arcade	28	31,620	342,492
Queen Anne's	67	29,831	825,231
Dayton, Lebanon & Western	23	62,120	836,300
Birmingham & Atlantic	42.46	62,005	1,165,884
Nashville & Knoxville	86.80	59,146	1,951,818
Leavenworth & Topeka	56.12	12,027	321,852
Florida Midland	44	3,310	46,721
Total	.....	358,645	5,933,935

"Thus it appears on examination that this criticism that ponds and creeks are absorbing a great share of the amount in these river and harbor bills is absolutely without foundation. The total amount included in the river and harbor bill of last winter for the streams of New England, excluding rivers of the first class, such as the Penobscot, Kennebec, Merrimac, Connecticut, and others, like the Mystic and Providence, which are merely inlets from the sea and used for harbor and anchorage, was $120,500, yet the total amount of freight carried upon these streams annually is not less than 2,000,000 tons.

"The large expenditures upon rivers which are now being pressed upon congress are rather for streams having a great volume of water. In sections of these rivers excellent navigation is available by nature, but in order to make them navigable throughout their full length divers improvements are required. In some the channels shift, because they flow through an alluvial soil; in others there are rocks and other obstructions which require removal; in others there are rapids, above and below which are excellent reaches of navigable water. In almost all there appear alternate shoals and pools, the presence of which is to be observed in all rivers which have any considerable descent in their course. Numerous rivers are now under consideration which have been surveyed and in which an estimate of the cost has been rendered. For the improvement of large rivers in the country estimates approximating $150,000,000 have been made by the engineers of the war department, a large share of which would be for locks and dams. One of the questions to be decided is whether these rivers should be improved on so extensive a scale. The improvement of the harbors of the country is largely made necessary by the adoption of deeper draught boats. Of late in the construction of ocean-going freight carriers the truss model has been adopted for hulls, and boats drawing 40 ft. are in sight if channels are available. Not only is there a demand for deeper draught boats, but traffic has increased enormously, and there is every indication of a continued increase.

PUSHING THE BIG IMPROVEMENTS.

"Of the $60,000,000 included in this bill nearly $50,000,000 is for great projects. The committee thought best, as far as possible, to push the great improvements of the country, which are essential to the development of its commerce, to completion. Even where there are two projects of equal merit, it has seemed best in many instances to select one and finish it, rather than to go on with piecemeal appropriations for two, three, or more years. That is the most business-like policy, and it is the

most economical policy. We could have brought in a bill here which would have carried in the aggregate, including these authorizations, not more than $40,000,000. Instead of authorizing $2,750,000 for the Southwest pass of the Mississippi river, we might have brought in an authorization of $1,250,000. That, no doubt, would have provided for the work for two years. We might, instead of providing an authorization of $4,000,000 for the St. Mary's river, between Lake Superior and Lake Huron, have made an authorization of $2,000,000. But in the first place it would not have been in accordance with business-like or economical policy. It is best for the government that these great projects be pressed to completion as rapidly as possible, and that the commercial interests should know what to depend upon; second, appropriations should be large enough to provide for large contracts. Thus economy can be secured in construction. There is another objection. If we had brought in a bill for only a small amount upon these authorizations we should have been guilty of cowardice. We believe it is best that this growing commerce of ours should be well provided for in the great ports of the country and that the finishing of these projects should be in sight. When there are great projects before us which must be completed, by which we can accomplish salutary results, and the amounts are under $1,000,000, the full amount required for them is included in our bill. If there is anyone who desires to cut down these authorizations, I can not agree with him, because these amounts will be required before the work is done. Why fail to recognize that fact? Why make the declaration to the country that we are content with the dribbling policy which was pursued for many years? I can cite improvements in this country that cost $4,000,000, where the work was scattered over more than twenty years before completed, where every stone laid in place throughout this improvement was absolutely unavailable until the last item of the work was completed; but yet under the policy pursued for years these great improvements were allowed to linger twenty years between beginning and completion. The committee does not think that to be good policy, nor do we believe it is the most economical.

"We have appropriated or authorized $12,000,000 for the Mississippi river. That is one-fifth of the total amount in this bill. We have appropriated or authorized a sufficient amount to prosecute the work for four years. We might have made it $6,000,000 and provided for two years, and there are many who give superficial examination to these bills who would have said how much more economical are those who would provide six millions than those who provide for twelve. But let us consider that a minute. In the first place, annual appropriations have been made for that stream for twenty-three years; the annual average in each year for the last eleven years for the portion below Cairo has been $2,433,000. We have cut down that amount to $2,000,000 per annum, with a further provision that $50,000 of that $2,000,000 may be expended for the operation of dredges belonging on the reach below Cairo, in that part above between Cairo and the mouth of the Missouri river. But, in order that the Mississippi river commission may know just where they are, we have provided that that appropriation shall run for four years, so that at the end of one year there need not be any uncertainty as to what to do the next year, and that they may know now in this year, 1902, just what amounts will be available for the years up to 1906 and make their calculations accordingly. Every just principle of economy, of efficient performance of work justifies the provision for the four years, if we are going on with this work at all, and I take it that we can not turn aside from that which has been the settled policy of the government for more than twenty years and omit the Mississippi river from the appropriations in our bill.

PROVIDING FOR A COMMISION ON LAKE LEVELS.

"Section 4 of the bill provides for the formation of an international commission, the members of which shall consider the very important subject of levels of the great lakes and other waters which find their outlet through the St. Lawrence. This provision is a necessary one. In many instances power canals have been constructed, or are in contemplation, which threatened to divert the water in a manner such as to materially interfere with the lake levels. Lowering the channel through the St. Mary's river 3 in. would cause damage to commerce that could probably be counted by millions of dollars. There is already a power canal there which has been opened on the Canadian side and one is in contemplation on our side. Also, in improving channels there it is necessary in some cases, in order to get the best depth of water, to go over into Canadian waters. To settle all these questions, the demand for this commission is immediate and pressing. It is also provided that they shall report upon the advisability of locating a dam at the foot of Lake Erie where the waters discharge through the Niagara river, and its probable cost. Engineers have already figured on that problem. On several occasions an ice jam at this place has caused a rise of water on the lake not only of inches but a foot or more, giving an object lesson as to the effect of a dam. There seems to be no slope in the water of the lake; if a rise of 14 in. is caused by an obstruction at the foot there is an equal rise at the mouth of the Maumee river, or at the other end of the lake. While we are making provisions for deepening harbors upon this lake, it is desirable to have an examination made whether the construction of a dam will not in a great degree provide increased depth.

"Perhaps it would be well for me to dwell briefly on a subject touched upon at very considerable length in the report. The committee, not only this winter but last, made examination of the expenditures for the Missouri river and found that the commerce on that stream was entirely disappointing; that on the stretch below Sioux City there has been appropriated by the government $8,723,000, and all there was to show for that was an annual traffic of 263,114 tons, of which 218,514 tons was made up of sand and building materials, carried an average distance of less than 2 miles. They found that, excluding these building materials carried less than 2 miles, the total tonnage below Sioux City was only 44,600 tons, and that if you count all the tonnage, on 263,000 tons, the average haul is less than 4 miles. This showing does not present to us any promise in the way of commercial development or justification for the continuance of these large appropriations. It appears that in 1899, on the Hudson river, for which there has been appropriated a sum considerably less than for the Missouri river, there was a traffic of 15,000,000 tons and more; and for the Ohio river there was a traffic of 13,579,000 tons; and for the St. Mary's river there was a traffic of 24,554,000 tons in 1899, and I may say that in the last year that has increased to over 28,000,000. There you have it, 28,000,000 as against 44,600 of traffic, excluding the sand, and a much larger sum appropriated for the Missouri river. On the Detroit river over 40,000,000 tons are carried in a year, and there has been appropriated for that stream less than for the Missouri river below Sioux City. There has been appropriated for that portion above Sioux City to Stubbs Ferry, or Fort Benton, $2,179,000, for a traffic of 23,041 tons. Three years ago, when this bill was under discussion, I attempted to show to the committee that an amount was appropriated there for ice harbors so considerable that it would be cheaper each autumn to burn every boat on that stretch of the stream and buy substitutes and make a gift of them to the owners in the spring than to attempt to maintain these so-called ice harbors. It is perfectly manifest to every one that the greater share of these amounts goes for what is called the rectification of the banks. For the systematic improvement, as it is called, of one reach of the Lower Missouri river, located in one congressional district, I believe, the sum of $2,600,000 has been expended, without securing any salutary results. If that systematic improvement were extended from the mouth to Kansas City, at least $30,000,000 would be required. The members representing that section appeared before us last winter and proved to us most conclusively that in the years before these large appropriations were made for the Missouri river there was a very considerable traffic upon it; and it would seem to the committee that in view of the fact that when no appropriations were made, or no considerable sum was appropriated, there was a large traffic, and that when enormous appropriations—for enormous is the right word in comparison with the benefits—are made there is no traffic, it might be well to return to the old order of small appropriations and a more considerable traffic. I have detained you longer than I intended, and have gone over this bill at considerable length. I maintain that, more than any measure brought into this house, the money expended under this bill will, in this commercial age, benefit the people of the United States.

"In submitting this bill from the committee, we maintain that it is not a measure for the benefit of certain localities, it is not a measure for the benefit alone of cities or towns here and there. It is not a bill which brings special privileges or advantages to individuals or to communities. If there are such items in the bill let members of the committee point them out. If we have made mistakes in this regard we desire to know. It is not a measure merely for the removal of rocks from the path of the mariner and to make his course plainer and safer. This is a bill which confers inestimable benefits upon our common country and upon all its people."

TRADE NOTES.

Mr. A. H. Folger, manager of the Lockwood Manufacturing Co., East Boston, Mass., was in Cleveland during the present week. He reports that his company is extremely busy on repair work and has had considerable to do on the lake boats that have gone to the coast. The iron works and docks of the company extend from 61 to 85 Sumner street, East Boston. Mr. Folger is visiting several cities during his present tour.

The well-known house of Almer Coe, optician, No. 74 State street, Chicago, has expert workmen and good facilities for the repair and testing of optical instruments of all kinds, including the United States mercurial barometer. The house announces that barometers will be compared free for vessel captains and repairs made promptly, so that all ordinary instruments may be put in order while the vessel is in port. A full stock of new barometers and all kinds of field and marine glasses is constantly carried.

New shops of the Philadelphia Pneumatic Tool Co., at Twenty-first street and Allegheny avenue, Philadelphia, are nearing completion and the company will remove from its present location to the above address the last week in this month. Everything will be in readiness for the full operation of the new plant in the course of two weeks. About $10,000 worth of new machine tools will be delivered early in June, and with these the company will soon be able to relieve its much overcrowded condition and be able to make more prompt deliveries. About 150 men will be required immediately to do the work it is now trying to do in crowded quarters with ninety-five men. There have recently been placed upon the market two new sizes of rotary drills and an improved riveting hammer has been perfected which is being made in three sizes, having capacities varying from ¼ to 1¼-in. rivets. The company has recently received orders aggregating nearly 200 tools from one of the largest ship yards in the country, and this together with a lot of railroad and other trade makes an unprecedented rush of business. Preparations are being made for an elaborate display of the company's pneumatic tools in a working exhibit at the convention of Master Mechanics and Master Car Builders, at Saratoga, June 18 to 25.

WORK OF THE GUNS AT MANILA AND SANTIAGO.

The following statistics of the battles of Manila and Santiago are from reports of the naval officers:

BATTLE OF MANILA.

Ship	No. of shots	Cost	Weight of shot, tons
Baltimore	1,434	$10,934	15.4
Olympia	1,677	10,605	13.1
Boston	1,106	9,778	13.7
Raleigh	591	8,026	10.2
Concord	582	6,466	8.9
Petrel	428	4,236	5.6
Totals	5,818	$50,045	66.9

BATTLE OF SANTIAGO.

Brooklyn	1,937	$18,640	25.1
Oregon	1,903	24,960	36.6
Iowa	1,473	15,820	21.8
Indiana	1,876	14,8296	19.5
Texas	835	6,405	8.6
Gloucester	1,369	3,658	2.6
Vixen	45	9%	0.1
Totals	9,474	$84,406	114.3

At Santiago out of 9,474 shots fired from the guns of large and small caliber there were 124 hits. The Oquendo was hit sixty-one times, the Viscaya twenty-eight times, the Maria Teresa twenty-nine times and the Colon six times.

DEVELOPMENT OF AFRICA.

"Commercial Africa in 1901" is the title of a monograph which will be published by the treasury bureau of statistics in its forthcoming issue of the monthly summary. It presents an elaborate study of the present commercial conditions in Africa, the growing demands of that great continent, and the market offered for American goods in its various sections. Africa occupies fourth place in the list of the grand divisions of the world in its consuming power in relation to international commerce, the imports of the grand divisions being, at the latest available date, in round figures: Europe, $8,300,000,000; North America, $1,300,000,000; Asia, $900,000,000; Africa, $430,000,000; South America, $375,000,000; and Oceania, $325,000,000. Of this total of $11,630,000,000, the United States supplies 5 per cent. in the case of Africa, 10 per cent. of the imports of South America, 10 per cent. of those of Asia and Oceania, 14 per cent. of those of Europe, and 40 per cent. of the imports of North American countries exclusive of the United States.

Within the memory of this generation the name of Africa was the synonym for mystery both as to history and condition. Physically the African continent is in many respects unique. Five thousand miles in extreme length, and over 4,000 miles in breadth, its area is greater than that of any other continent except Asia, the latest estimate being 11,874,600 square miles, and its population variously estimated at from 125,000,000 to 175,000,000. Its coast formation is peculiar in the absence of deep indentations, bays, or harbors, and the small number of waterways which offer entrance to its interior. The fact that the greater part of the interior is an elevated tableland extending on all sides to within a short distance of the coast renders access to the interior by the few large streams difficult. At the points where the rivers pass from the elevated plateau of the interior to the lowlands of the coast the falls or rapids which there exist prevent navigation, and as a result travel to the interior by water developed more slowly in Africa than in any other continent. When these conditions were established, however, modern ingenuity and energy soon found a means of transporting steamers in small pieces upon the backs of men through the forests, around the falls and rapids for scores and even hundreds of miles, and, putting them together, set afloat the steamers which penetrate thousands of miles into the interior and develop facts never before known, and which could not have been developed by land exploration in the tropical climates and jungles for many generations.

Africa has, within the past few years, become the "hinterland" of Europe. Seven European nations now control territories in Africa, two of them having areas equal in each case to about the entire land area of the United States, while a few small territories remain as independent states. Beginning at the northeast, Egypt and Tripoli are nominally at least tributaries of Turkey, though the Egyptian government, which was given large latitude by that of Turkey, has of late years formed such relation with Great Britain that, in financial matters, at least, her guidance is recognized; next west, Algeria, French; then Morocco on the extreme northwest, an independent government and an absolute despotism; next on the south, Spain's territory, Rio de Oro; then the Senegal territories, belonging to the French, and connecting through the Sahara desert with her Algeria; then a group of small divisions controlled by England, along the gulf of Guinea; then Liberia, the black republic; Togoland, controlled by the Germans; Dahomey, a French protectorate; the Niger territory, one-third the size of the United States, controlled by England; Kamerun, controlled by Germany; French Kongo; then the Kongo free state, under the auspices of the king of Belgium, and occupying the very heart of equatorial Africa; then Portuguese Angola; next, German Southwest Africa; and finally, in the march down the Atlantic side, Cape Colony, British. Following up the eastern side comes the British colony of Natal; next, Portuguese Africa, and west of this the great territory known as Rhodesia; then German Africa, which extends almost to the equator; north of these British East Africa, fronting on the Indian ocean, and merging northwardly with the Egyptian Sudan, which was recovered from the Mahdi by the joint operation of British and Egyptian troops, and the British flag placed side by side with that of Egypt; next north, upon the coast, Italian territory, and a small tract opposite the entrance to the Red sea controlled by England; and a few hundred miles west of the entrance to the Red sea, the independent kingdom of Abyssinia.

Commercially the development of Africa keeps pace with its development in transportation, mining, and agricultural conditions. Wherever steam offers a method of prompt and inexpensive transportation, or wherever the presence of valuable minerals attract mankind in large numbers commerce quickly develops. The business of ports adjacent to the great diamond and gold mines of South Africa has increased rapidly in the last few years. The imports of Cape Colony, through which passes a large proportion of the merchandise for the mining regions in that part of Africa, have grown from $55,000,000 in 1894 to $100,000,000 in 1900. Those of Natal, through which also passes a considerable quantity of goods in transit for the interior, have likewise increased considerably, and into Portuguese East Africa, whose ports lie considerably nearer to the gold and diamond mines than to those of the Cape, the imports have shown a marked increase, the importation of goods in transit for the gold fields in 1897 at Portuguese ports alone having been about $15,000,000 in value.

The total foreign commerce of Africa is estimated at $700,000,000, of which about $430,000,000 represents imports and $270,000,000 exports. Of the exports, especially those from the south, a large share is gold and diamonds; in the tropical regions, ivory, rubber, palm nuts and gums: in the north, the exports are chiefly products of agriculture, cotton, coffee, cacao, spices, dates, etc.

Of the total recorded imports into Africa in the latest available year, aggregating $429,461,000, $157,575,000 went in to British territory, $92,004,000 in to French territory, $77,787,000 in to Turkish territory, $20,795,000 Portuguese, $8,336,000 German, and $4,722,000 into the Kongo free state. Of this importation of $429,461,000, about 5 per cent. was furnished by the United States, our total exports to all Africa being in the fiscal year 1900, $19,469,849, and in 1901, $25,542,618.

Railroad development in Africa has been rapid in the past few years and seems but a beginning of a great system which must contribute to the rapid development, civilization and enlightenment of the dark continent. Railroads already extend north from Cape Colony about 1,500 miles and south from Cairo about 1,200 miles, thus making 2,700 miles of the "Cape to Cairo" railroad complete, while the intermediate distance is about 3,000 miles.

SHIP BUILDING AT NEWPORT NEWS.

Newport News, Va., May 14.—Another large repair contract has just been received by the Newport News Ship Building & Dry Dock Co., amounting to something like $50,000, it is said. The Morgan line steamer El Mar has arrived here to receive new boilers and to be completely overhauled. The vessel will remain here for some weeks. El Mar and El Sol were built at Cramps, while the quartet, El Rio, El Norte, El Cid and El Sud were built here in the early 90's. Since then the Newport News company has built eight ships for the Morgan line, making twelve in all, besides several steel tugs. The aggregate cost of these vessels was in the neighborhood of $8,000,000.

During the recent target practice of the ships of the North Atlantic squadron at the southern drill ground, just outside of the Virginia capes, the battleship Kearsarge, which is a product of the Newport News company, carried off the honors, and hereafter, according to naval officers, the gunning record of the American navy will be based on the phenomenal record of the Kearsarge during these maneuvers. The test to which Admiral Higginson put his ships is considered from the standpoint of accuracy and rapidity of fire of the heavy guns, in both of which respects, according to an authorized statement, every previous performance was eclipsed and the Kearsarge, it is stated, holds the world's record with seven hits out of eleven trials with 13-in. guns at a distance of one mile. The targets used in the squadron practice were rafts 45 ft. long, with masts, between which was stretched canvas. Enough sea was running during the maneuvers to make the targets bob like corks, though the ships maintained a fairly steady gun platform, but for all that the practice was such as to exercise the greatest skill of the gunners. Steaming at half speed the ships poured their shots into the targets in rapid succession, and the training acquired during the recent winter cruise in the West Indies was manifest in the magnificent work of the crews, independent of the hits scored. Every vessel made a fine showing, but the Kearsarge carried off the palm with seven hits to her credit out of eleven shots fired from her 13-in. guns. In the test of rapidity of fire from this ship only one minute elapsed from the time the projectiles left the magazines down in the bowels of the ship until they were hurled from the guns.

The battleships Kearsarge and Alabama and the flagship Olympia, flying Rear Admiral Higginson's flag, are the only ships of the squadron now in these waters. The Massachusetts sailed Saturday for New York navy yard for repairs. The Indiana was detached some time ago. The Cincinnati, which would probably have been attached, was ordered to hurriedly sail for Santo Domingo to protect American interests there. She is now at Martinique representing this government in looking after the needs of the survivors of Thursday's volcano horror. The Kearsarge is off Newport News taking on coal. The Olympia and the Alabama have dropped down to Old Point after coaling. Last Thursday two battalions of seamen from the ships of the squadron were sent to Washington on a special steamer to take part in the funeral of Rear Admiral Sampson, returning on Saturday. The converted yacht Gloucester is at Old Point having aboard the members of the naval board of inspection and survey, who are making a thorough inspection of each of the ships with a view of determining the extent of the repairs necessary.

Rear Admiral Higginson will take the Olympia, Kearsarge and Alabama out to meet the French cruiser Gaulois, which is due at the Capes about May 20 from France, having aboard the members of the mission which will represent the French republic at the unveiling of the Rochambeau statute in Washington May 24. The three ships will escort the Frenchman up the bay to Annapolis, where the mission will take a special train for Washington. It is not unlikely that the three war ships will accompany the Gaulois to several of the northern cities before she sails for France.

The naval sailors' rest of the Hampton Roads harbor mission, recently organized with ex-Chaplain Steele of the United States navy at its head, was formally opened in Hampton Monday night with an interesting program. Rear Admiral Higginson was present and he came with several hundred officers and men of the North Atlantic squadron. Other speakers, in addition to the admiral, were Capts. Lyon, McCalla and Brownson of the Olympia, Kearsarge and Alabama, respectively; Rev. Dr. W. C. Stutt, secretary of the American Seamen's Friend Society, and Col. William Lamb, the hero of Fort Fisher, who is president of the Norfolk Seamen's Friend Society. The Hampton Roads harbor mission will establish a home here for merchant seamen and one at Norfolk for both merchant and naval seamen.

The Pacific Mail liner Korea is ready to sail as soon as the word is given by her owners. She will go directly to New York from here and will then sail for Hong Kong, it is understood, via the Suez canal, afterwards making her maiden trip across the Pacific to San Francisco.

The Coastwise Steamship Co.'s barge Chalmette, which was put up for sale, was bought in by the former owners. The bids were low and the Coastwise company's representative bought the vessel for $500. The Chalmette is a barge of only 1,000 tons capacity and the company's largely increasing ocean coal trade requires barges of greater capacity, most of its vessels carrying 3,000 and 4,000 tons of coal.

The American steamship Shawmut sailed this week for San Francisco, her course carrying her around the horn. She will stop at a South American port and discharge part of her cargo and will then continue on to San Francisco with a large cargo of coal, which she carries.

It is stated that a number of barges plying out of Hampton Roads will be fitted out as oil tank ships and will be put in service out of Galveston. A tug left here several days ago with three converted barges and it is understood that several more will leave in the next few days.

The American sailing ship Erskine L. Phelps, which was damaged in collision in the Delaware and which was repaired at the ship yard here, is loading a large cargo of coal for Manila.

The new propeller passenger steamer Virginia is showing her heels to fast vessels plying Hampton Roads. She was built by the Wm. R. Trigg Co. at Richmond for the Chesapeake & Ohio. Within the past few days she has outsteamed the N. Y. P. & N. R. R. steamer Pennsylvania and the new Old Dominion flyer Hampton. If she succeeds in running ahead of the steamer Newport News, which was built here, she will be entitled to carry the broom.

In Cobb, Butler & Co.'s yard, Rockland, Me., preliminary arrangements are being made for the construction of a 500-ton schooner.

A FAN OF GREAT VOLUME.

Mr. W. Carlile Wallace, known to a great many ship builders and ship owners of the United States on account of his connection with the Ellis & Eaves draft business of John Brown & Co. of Clydebank, is about to introduce in this country a centrifugal fan for which wonderful claims are made. It is known as the Sirocco fan. The patents are owned by Davidson & Co., Ltd., of Belfast, a large engineering concern that has branches in London, Manchester, Glasgow, Bristol, Calcutta and Colombo. Mr. Wallace has about completed arrangements at the Schenectady works of the General Electric Co. for tests and an exhibition of the fans and the manufacture of them in this country will be undertaken shortly. They are long past the experimental stage. Thousands are in use on the other side. The White Star liner Celtic is among large ships on which these fans have recently been installed.

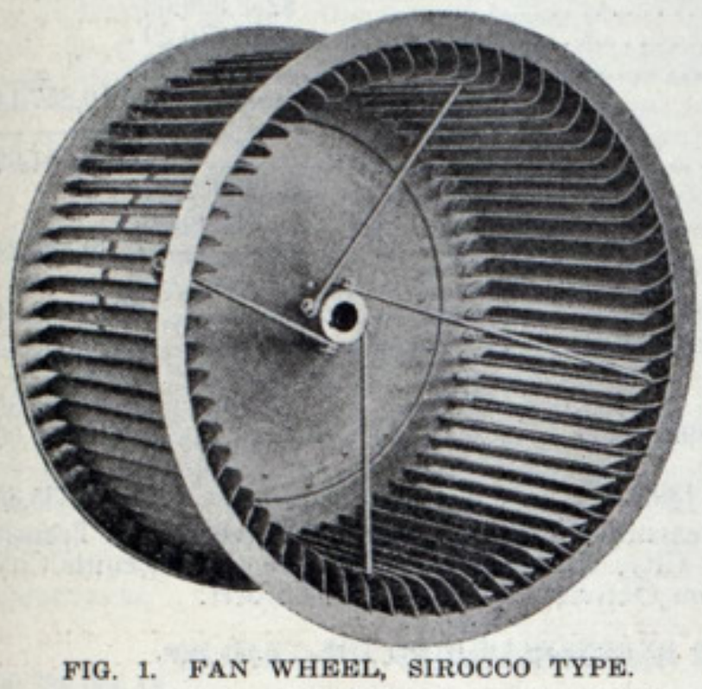


FIG. 1. FAN WHEEL, SIROCCO TYPE.

What has hitherto been generally accepted as best construction for centrifugal fans, and technically formulated as such in text books, is in Sirocco centrifugal fans practically reversed on every point. The chief points of this reversed construction may be summarized as follows: In the Sirocco fans the blades are very numerous with their radial measurement (relatively to the diameter of the fan) very shallow, and their axial measurement very long. Their outer edges are curved forward in the direction of rotation, and the air passages between the blades are usually open at the ends towards the inflowing air. The inlet for admitting the air to the fan, and also the outlet for its discharge, are approximately of equal diameter to that of the fan itself. The practical effects of this new construction are that in these fans the volume of air discharged per revolution is from three to four times greater than in the best types of other centrifugal fans of equal diameter.

The fan wheel, Fig. 1, is called the rotary member. It will be seen that the number of blades is large. There are in fact sixty-four, and a curious feature is that over a large range of sizes of fans this particular number of blades (sixty-four) appears to give the best results. It will also be noted that the blades are very short radially. Measured radially the blades are one-sixteenth of the diameter of the fan deep. Axially, however, the blades are long, three-fifths of the diameter, this dimension having been found to give the best results. The outer edges of the blades are bent forward, to a set angle, in the direction of rotation, and at one end they are slightly cupped. The inlet and outlet of the fan are approximately of equal area to that of the fan itself. It is claimed that the special form of blade employed, and its special size and shape, does away almost entirely with the detrimental and power-absorbing eddies which are so frequent with a number of other fans. Moreover, it is further claimed that the velocity of the air as it is discharged from the Sirocco fan is greatly

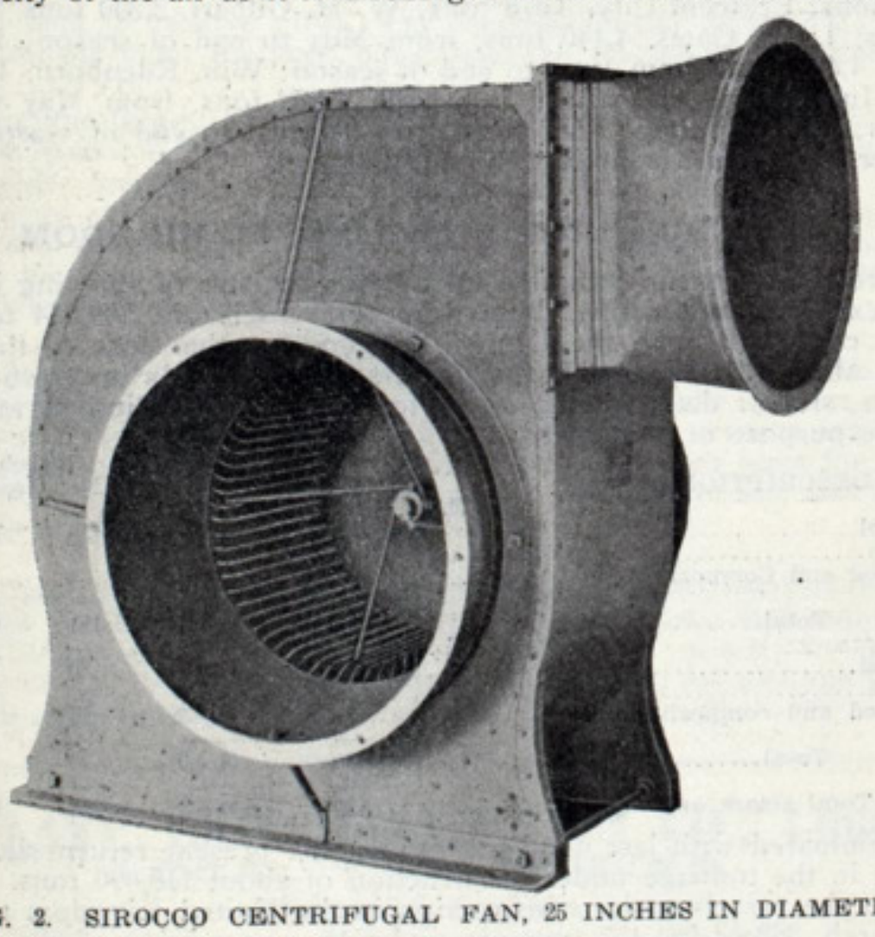


FIG. 2. SIROCCO CENTRIFUGAL FAN, 25 INCHES IN DIAMETER.

accelerated, so much so that it actually exceeds the peripheral speed of the blades by as much as 80 per cent. In this fan eddies are conspicuous by their absence. The intake draught of the fan is wonderfully regular, practically not varying over the whole area of the intake. It is just as though a solid cylinder of air were being drawn bodily into the inlet, and the velocity of the air appears to be absolutely the same over the whole area. In the matter of speed of discharge numerous tests have shown the air to be 80 per cent. in excess of the rate of rotation of the tips of the blades.

Fig. 2 is a Sirocco centrifugal fan of 24 in. diameter, overcast type, which Davidson & Co. show in one of their circulars and which was subjected to a volumetric test (free intake and discharge) in comparison with a spirally-cased centrifugal blower fan of well known make. Referring to this test the manufacturers of the Sirocco fan say: "In our fans the volume of air dealt with per revolution is relatively so great that the passageway for same around the circumference of the fan requires to be equivalently large, consequently the casing or housing for the Sirocco is (relatively to the diameter of the fan wheel) much larger than in other centrifugal fans, the inlet and outlet openings to and from the Sirocco fan being about four times larger in area than those employed in other centrifugal fans of the same diameter, and of which the blower fan used in this test is considered one of the most efficient." The report of the test is as follows:

SPIRALLY-CASED SIROCCO CENTRIFUGAL FAN VERSUS SPIRALLY-CASED CENTRIFUGAL BLOWER FAN OF A WELL-KNOWN MAKE.

	Diam. of fan wheel in inches.	Rev. per minute.	Circumferential velocity in ft. per minute	Air discharged in cu. ft. per minute.
Sirocco fan	25	575	3,763	16,520
Centrifugal blower	24	600	3,768	3,250
Extra volume discharged per minute by Sirocco fan.....				13,270

This shows in the Sirocco fan a volumetric discharge over 400 per cent. greater than that of the blower fan.

VOLCANOES AND THE ISTHMIAN CANAL.

The April earthquakes in Guatemala, by which it is now reported that 5,000 or 6,000 lives were lost, and the yet more appalling catastrophe in the Windward islands, illustrate again the utter helplessness of the human creature and the futility of the strongest works of his hands, when assailed by the unknown forces of the globe's interior. This is the commonplace remark suggested by the recent earthquakes and volcanic furies. Is it not better to derive from these events, if possible, a lesson and a warning of some practical benefit to the people of this country and the world in general? The United States government is about to construct an interoceanic canal. Either congress or the executive will soon have to decide between the Nicaragua route and that by way of Panama. The danger of destruction to the canal by seismic disturbances is one of the recognized factors of the problem. The first report of the Isthmian canal commission discussed this danger, apportioned it about equally as between the two routes, and dismissed the possibility of canal destruction in this manner as a "risk which may be classed with that of a great conflagration in a city like Chicago in 1871, or Boston in 1872." The danger from direct volcanic activity, that is, from eruptions, was not considered by the commission. Martinique, however, has just shown the world what an awakened volcano can do. The Nicaragua route is lined with volcanoes, some of them having demonstrated the tremendous activity of the fires underlying that part of Central America. It is sixty-seven years since Coseguina, in the northwestern corner of Nicaragua, burst forth with an explosion which lasted for forty-four hours. The noise was heard for 1,000 miles; the ashes were carried by the wind 1,400 sea miles from the crater. The mass of matter ejected in that eruption of Coseguina has been computed as great enough to have covered a surface equivalent to eight times the surface of France. The eminent French engineer, M. Bunau-Varilla, has estimated that during the forty-four hours of activity the output of stones and ashes every six minutes of the time was equal in volume to the total volume of the prism of the Nicaragua canal as calculated by the commission. That is to say, Coseguina poured out in six minutes what it would take the canal contractors eight years to excavate.

Such another volcano in constant activity, with its last great eruption as recent as 1883, dominates the island in Lake Nicaragua which every ship will skirt on the passage from Greytown to Brito. This is Mount Ometepe. On the same island is a second volcanic peak, that of Madera. In 1844, seven years after the explosion of Coseguina, occurred the great earthquake which destroyed the city of Rivas, near the Pacific shore, and wrought great damage even at Greytown, 150 miles away on the Atlantic side. The line surveyed for the Nicaragua canal between the lake and Brito runs only 5 miles from Rivas.

We now quote from M. Bunau-Varilla, who, although formerly engineer-in-chief of the Panama canal and therefore a partisan of that route, is entitled to be heard on any question of fact with the respect due to his personal character and professional eminence:

"In Panama there is within a distance of 180 miles from the canal no volcano, even extinct. The Isthmus there, since its formation in the early quarternary period, before man appeared on the earth, has not been modified. This is quite the contrary in Nicaragua, which has always been the site of seismic convulsions, whose lake was formerly a gulf of the Pacific ocean, and whose name was associated with the most terrible volcanic explosion (Coseguina) ever recorded in history before the Krakatoa explosion. It must be borne in mind that these terrible menaces would mean, if realized, not only the destruction of that costly canal, but the ruin of the immense interests on both sides of the Atlantic which will have been developed by the great waterway and receive a death blow by its paralyzation. Nothing similar can be feared in Panama, as no trace of any volcanic activity may be found on that isthmus, whose rare and small seismic vibrations come from distant centers."

A few days ago the question of volcanic menace seemed so remote as to be almost negligible in the consideration of canal legislation. Today, on account of the impressive demonstration made by Pelee and Morne Garu, that question merits and should receive in congress the most careful attention.—New York Sun.

The McClintic-Marshall Construction Co. of Pittsburgh, builders of iron and steel construction work, have received a contract from the St. Clair Furnace Co. for a great steel railroad trestle which is to extend from the level of the terminal railroad system of the St. Clair works at Clairton over the steel storage ore bins from which the furnaces are to be directly fed with iron ore. The trestle will be 360 ft. long with twelve separate spans. Extending from the trestle overhead will be a number of tracks from which the ore in steel hopper railroad cars will be dumped to the steel bins. These bins will discharge the ore into small hoppers which will be carried by the conveying system of the Brown Hoisting Machinery Co. of Cleveland to the furnaces. The contract for this bridge has been placed with the American Bridge Co.

DEATH OF JOHN T. HUTCHINSON.

The death of John T. Hutchinson, vessel owner of Cleveland, was not unexpected, but it was nevertheless a shock to the vessel community in Cleveland. He died in his office in the Perry-Payne building at 4 o'clock Wednesday afternoon. He had been to the office very little of late. In about six weeks he had been down town only once and that a few days ago. He had been ailing all winter. Heart trouble had made a great change in him. Less than a year ago he was apparently in the best of health. When he dropped into the office Wednesday, cheerful as he always was, he said he was feeling very much improved. For probably two hours he talked with W. H. McGean, a member of the firm of Hutchinson & Co., and with the other men around the office. He was comfortable in a rocking chair that he had used very much when he was at the office every day. Nothing happened to excite or disturb him. Suddenly the men around him saw him gasp for breath and his head fell. There was no struggle. He was probably dead before he had been lifted tenderly to a couch that was only a few feet away. Physicians were called and one of them was on hand in a few minutes, but his hurry was of no avail.

Mr. Hutchinson was very highly regarded in vessel circles. Practically his entire life was spent at the business. He had friends in all parts of the lakes. His manner of doing business, according to the old school, was plain and upright. He was of a genial disposition, not at all given to worry, and his happy manner made friends in his business affairs, but he was after all very much of a home man, especially of late years. Oswego, N. Y., was Mr. Hutchinson's birthplace. He came to Cleveland at twenty-five years of age and soon thereafter became interested in vessels. His first vessel was the schooner Ellen White, a craft that would be regarded as a very small affair now. His interests in the Ellen White type of boat gradually increased until he built the schooner Emma C. Hutchinson in 1873. When she was built the Emma C. Hutchinson was one of the finest vessels on the lakes. Mr. Hutchinson's first steel vessel was the 5,000-ton steamer that bears his name and which is only in her second year. He was sixty-eight years of age Sept. 12 last. He is survived by his widow, who was before marriage Emma C. Camp of Cleveland; by a son, Charles L. Hutchinson, who is also in the vessel business, and by a daughter, Mrs. S. A. Mintz.

MR. FOSS SOUNDS A NOTE OF WARNING.

The naval appropriation bill, which provides for two new battleships, two armored cruisers and two gunboats, and carries a total of $77,650,000, was taken up in the house of representatives this week. Representative Foss of Illinois, chairman of the naval committee, in opening the debate sounded a note of warning against the over-confident belief that our navy is invincible. He said that, while we have 138 ships built and building, yet comparatively few of them have any real fighting value. Most of those now building are what are termed peace boats.

"I know," Mr. Foss said, "that there are some who think that just because we whipped Spain in a fight of a hundred days and lost only a single life that we could wipe out the fleets of the navies of the world. There is an impression that the American navy is strong and powerful. Yes, it is, so far as it goes. I believe we have better officers, better men, and that our ships, ship for ship, are better than those of any navy in the world. But do not let us delude ourselves with the thought that because we whipped a little nation, which had only a little navy, that therefore we can whip anything that comes along. It would have been to our everlasting shame if our two fleets at Manila and Santiago had not sunk both of the Spanish fleets. Why? Because they were superior; they had a greater tonnage, each one of them. I have a statement showing the relative comparison of the two fleets at the battle of Manila and the battle of Santiago, and, while I would not for a single moment disparage the bravery and the courage of our American officers and men and the value of our ships, yet if there is any lesson to be learned from the Spanish-American war it is that superior men, superior ships, both in tonnage, in armament and in armor, superior gunnery, superior marksmanship, will win in the future as they have won in the past."

LEWIS NIXON'S SHIP YARD INCORPORATED.

The ship building establishment of which Lewis Nixon is the head has filed articles of incorporation at Elizabeth, N. J., under the title of the Crescent Ship Yards Co., the papers showing an authorized capital of $1,200,000 divided into shares of $100 each. The corporation is a continuation of the old organization, which has leased for the last eight years the ship yard of the Samuel L. Moore & Sons Co. The new organization is privileged to do many things, including mining, manufacturing and transportation of every description. Mr. Nixon said that he had a great many contracts in his own name, and that the company was incorporated simply to protect his associates in the business against any possible entanglements in case of the death of himself or any other member of the company. It is rumored in Elizabeth that the Crescent Ship Yards Co. will soon absorb the Samuel L. Moore & Sons' Crescent Iron Works, opposite the ship yard, which does a large amount of work for the yard. Mr. Nixon had an option on the iron works, but it expired two years ago. The Moore & Sons' Co. stands ready, a member of the firm said, to sell the plant to Mr. Nixon for a specific price in cash, but not for securities in the new ship building corporation. This Mr. Nixon had previously offered, but it was not satisfactory to the other firm.

Alfred Jones of the Elder, Dempster Steamship Co. has offered free passage annually to Canadians and Americans holding Rhodes scholarships at Oxford.

AMERICAN STEAMSHIP CO.'S BONDS LISTED.

Recently there was listed on the New York stock exchange $5,452,000 first mortgage 5 per cent. gold bonds of 1920 of the American Steamship Co. of West Virginia, owned by the American Steel & Wire Co. The stock of this company was transferred on June 4, 1901, to the Pittsburgh Steamship Co., which is the name under which the United States Steel Corporation operates its lake fleet. Accompanying the application for listing of the bonds is the following statement of the earnings of the American Steamship Co. during the years 1899 and 1900:

EARNINGS AND EXPENSES DURING THE YEAR 1899.

Steamer earnings		$696,151.76
Operating expense	$258,996.62	
Hull insurance	42,676.29	
Repairs	9,184.23	
		310,857.14
Net earnings		$385,294.62
Less expenses, etc	$ 26,922.55	
Less bond interest	12,605.83	
		39,528.38
Net profit for 1899		$345,766.24
Surplus from Zenith Transit Co		66,569.15
		$412,335.39
Less dividends paid in 1899		349,000.00
Surplus Dec. 31, 1899		$ 63,335.39

The above represents earnings from July 1 on the five Zenith Transit Co. boats, namely, Queen City, Crescent City, Empire City, Zenith City and Superior City, and from October on the W. H. Gilbert.

EARNINGS AND EXPENSES DURING THE YEAR 1900.

Steamer earnings		$1,550,987.90
Operating expense	$614,429.45	
Hull insurance	117,892.67	
Repairs	5,000.67	
Loss on insurance disasters, 1900	2,702.42	
		740,025.21
Net earnings		$810,962.69
Sundry credits, insurance, etc		8,022.94
		$818,985.63
Less expense, etc	$ 31,197.89	
Less bond interest and premiums	26,021.69	
		57,219.58
Net profit for 1900		$761,766.05
Surplus Dec. 31, 1899		63,335.39
		$825,101.44
Less dividends paid in 1900		600,000.00
Surplus Dec. 31, 1900		$225,101.44

The above represents earnings of steamers as follows: Zenith City, 3,429 tons; Queen City, 3,198 tons; Empire City, 3,269 tons; Superior City, 3,694 tons; Crescent City, 3,676 tons; W. H. Gilbert, 2,200 tons, for whole season; J. W. Gates, 4,440 tons, from May to end of season; I. L. Ellwood, 4,432 tons, from June to end of season; Wm. Edenborn, 4,432 tons, from July to end of season; J. J. Hill, 4,578 tons, from May to end of season; A. B. Wolvin, 1,587 tons, from August to end of season; W. P. Palmer, 1,609 tons, from July to end of season.

SHIP BUILDING IN THE UNITED KINGDOM.

From the returns compiled by Lloyd's register of shipping it appears that, excluding war ships, there were 431 vessels of 1,240,344 tons gross under construction in the United Kingdom at the close of the quarter ended March 31, 1902. The particulars of the vessels in question are as follows, similar details being given for the corresponding period in 1901 for the purpose of comparison:

DESCRIPTION.	March 31, 1902. No.	Gross tonnage.	March 31, 1901. No.	Gross tonnage.
STEAM.				
Steel	399	1,213,144	410	1,293,071
Iron	1	200	1	190
Wood and Composite	1	160	4	902
Total	401	1,213,504	415	1,294,163
SAIL.				
Steel	15	25,283	9	7,120
Iron	..	.....	..	.....
Wood and composite	15	1,557	20	1,833
Total	30	26,840	29	8,953
Total steam and sail	431	1,240,344	444	1,303,116

Compared with last quarter's figures the present return shows a decrease in the tonnage under construction of about 119,000 tons.

Of the vessels under construction in the United Kingdom at the end of March, 363 of 981,457 tons are under the supervision of the surveyors of Lloyd's register with a view to classification by that society. In addition, eighty vessels of 311,950 tons are building abroad with a view to classification. The total building at the present time under the supervision of Lloyd's register is, thus, 443 vessels of 1,293,407 tons.

During the quarter ended March 31, 109 vessels of 221,799 gross tonnage were begun and 136 vessels of 302,366 gross tonnage were launched.

The dominion government has made a contract with the Halifax & West India Steamship Co. for a monthly service between Halifax and Jamaica, which will continue in force until Dec. 31, 1906. The steamer to be used is the Beta, of 1,037 tons register. The company is to receive a subsidy of $13,800 per annum, or at the rate of $1,150 a trip for twelve trips.

ANOTHER MAN WITH A FOUR-DAY SHIP.

A report from London is to the effect that Mr. H. E. I. Camps of the London firm of Camps & Pierce, consulting engineers and naval architects, has designed an Atlantic liner, said to be capable of beating the trans-atlantic record by almost two days. Mr. Camps proposes working with turbine engines supplied with steam by water-tube boilers. By using oil as fuel he will save weight and space. Oil will be carried in the double bottom of the ship underneath the boilers. But possibly it would be best to let Mr. Camps tell his story. He seems capable of it. He says:

"The speed of my vessel will not be less than 30 knots an hour, more than 6 knots faster than the swiftest liner afloat. This is got without sacrifice of strength or stability. This speed will shorten the Atlantic passage by at least a full day, the record being about 5½ days, while my steamer will do it easily in 4½. By taking the proposed route of the Canadian fast Atlantic service the greater part of another day can be knocked off, enabling a busy man to get from capital to capital in less than four days. My steamer is over 700 ft. long—about the same length as the Oceanic. To drive her at the stated speed the huge installation of 80,000 H.P. has been decided upon. This is more than double the horse power in any existing or proposed Atlantic greyhound. That of the Oceanic is 28,000, and that of the Deutschland, the Hamburg-American crack, 35,600. In spite of this I am able to save more than 50 per cent. in the weight of machinery and boilers over the ordinary type of liners. The boat will be not only the fastest vessel afloat but the neatest. The present would be the best opportunity for the Canadian government to step in with its fast line, so long suggested. I am willing to place my services at the disposal of Canada and to give the dominion government the benefit of my ideas. This would enable them to checkmate the operations of any hostile trust, and to annex the passenger traffic of the North Atlantic by feeding the United States through Canadian ports, the reduction in the time occupied for the journey being sure to prove irresistible to the great majority of passengers."

WORK AT THE FORE RIVER SHIP YARD.

Boston, May 14.—Work on the concrete dock along the new fitting-out wharf at the works of the Fore River Ship & Engine Co., Quincy, Mass., has begun. The dock will be the foundation upon which the 75-ton gantry crane that has just arrived at the yard will travel. As soon as a sufficient length of concrete has been finished the crane will be set up so as to be ready for immediate use. The housings and mechanisms of the new set of large plate rolls, that are the latest addition to the equipment of the ship tool house at the Fore River works, are being put in place and the machine will be at work before long. Two of the rolls are fine pieces of Krupp steel that were once the shafts of "Jim" Fisk's famous old steamer, the Providence, and the third was forged and finished entirely at Fore River. There will be a mile of gravity railroad tracks under the new ship house. The construction of the battleships New Jersey and Rhode Island is being pushed as fast as possible and the gravity road will bring materials from all over the yard to every part of the ship house under which they stand.

The official government test of the casting of the 20-ton steel stem of the New Jersey was made Monday. The casting was raised 10 ft. from the ground by a temporary derrick and then dropped by the cutting of the suspended rope. The test was entirely satisfactory.

Seventy-five more pneumatic tools have been added to the equipment at Fore River, making the number now in use in the yard several hundred. The "air" for them is supplied by the new 5,000-ft. compressor recently installed in the power house, the 1,000-ft. compressor formerly in use being held in reserve now. The staging for the battleship Rhode Island is all up under the ship house and the raising of the frames has begun.

One of the largest and quickest shipwright jobs that has been done on Boston harbor for a long time has just been finished by this company. It is a rudder forging for the British steamship Nyassa, which is undergoing repairs at the Townsend & Downey works. The forging is of wrought iron and weighs 9,620 lbs. Its height is 36 ft. 2 in.; breadth, 6 ft. 8 in., and the diameter of the stock 8 in. The Fore River company completed the work in three weeks.

The Marine Iron Works, Chicago, launched on May 12 the steam yacht Oswegatche, which is intended for cruising on Lake Ontario and the St. Lawrence (Thousand islands) region. There are so many interesting features about the boat from a technical standpoint, aside from the fact of eastern owners coming to a western builder, that the Review will shortly publish an illustrated description of her.

The Chicago Pneumatic Tool Co. has been awarded contracts for three of its large Franklin air compressors for the Philadelphia & Reading railway; two compound air compressors of 2,000 cu. ft. capacity for the new car shops of the New York, New Haven & Hartford railway and one for the Atchison, Topeka & Santa Fe railway.

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LOCAL TIME TABLES.

STEAMER URANIA.

BETWEEN PORT STANLEY AND CLEVELAND.

Leave Port Stanley—Tuesdays and Wednesday, at 11.00 p. m.; Saturdays, at 11.00 a. m.
Leave Cleveland—Mondays, Wednesdays and Fridays, at 10.00 p. m.

Arrive Cleveland—Wednesdays and Fridays, at 6.00 a. m.; Saturdays, at 5.00 p. m.
Arrive Port Stanley — Tuesdays. Thursdays and Saturdays, at 6.00 a. m.

BETWEEN RONDEAU AND CLEVELAND.

Leave Cleveland—Mondays, Wednesdays and Fridays, at 8.00 a. m.; Saturdays, at 5.30 p. m.
Leave Rondeau—Sundays, at 11.30 p. m.; Mondays, Wednesdays and Fridays, at 4.00 p. m.

Arrive Rondeau—Mondays, Wednesdays and Fridays, at 1.30 p. m.; Saturdays, at 11.00 p. m.
Arrive Cleveland—Mondays, at 6.00 a. m.; Mondays, Wednesdays and Fridays, at 7.30 p. m.

NOTE.—There is no train connection with steamer to and from Rondeau on Sundays.

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A SUMPTUOUS CATALOGUE.

The F. W. Devoe & C. T. Raynolds Co. of New York have just issued a strikingly beautiful catalogue under the caption "A Few Pleasant Words from Some Yachting Experts to F. W. Devoe & C. T. Raynolds Co." The pleasant words are letters to the company from yachtsmen regarding the use of the company's paints and varnishes upon their yachts. The make-up of the catalogue is most attractive. On one page is published the letter of commendation and the portrait of the master of the yacht and on the opposite page the photograph of the yacht. The half tone reproductions of the yachts are beautiful and embrace J. Pierpont Morgan's yacht Columbia; Sir Thomas Lipton's Shamrock II; Sir Thomas Lipton's steam yacht Erin; Mr. A. S. Bigelow's steam yacht Pantooset; John H. Hanan's steam yacht Taurus; Mr. Elbridge T. Gerry's steam yacht Electra; Mr. H. H. Rogers' steam yacht Kanawha; Mr. Charles M. Pratt's steam yacht Jathniel; Mr. August Belmont's steam yacht Scout; Mr. J. J. Hill's steam yacht Waconta; Mr. J. Herbert Ballantine's steam yacht Juanita; Mr. George Lauder's steam yacht Endymion; Mr. Frank T. Morrill's steam yacht Buccaneer; Mr. George B. Thomas' steam yacht Nushka; Mr. C. K. G. Billings' steam vacht Surf; Col. William Hester's steam yacht Willada. The letters from masters embrace the well-known names of Charles Barr, skipper of the Columbia; E. Sycamore, master of Shamrock II; William A. Matthews, master of the steam yacht Erin; Alex. C. Corkum of the Pantooset, Edwin Sherlock of the Taurus, George E. Wicks of the Electra, George E. Nutter of the Jathniel, M. F. Buckley of the Scout, D. A. Weed of the Waconta, J. H. Pruett of the Juanita, James A. Loesch of the Endymion, Capt. Theodore Heilbron of the Buccaneer, W. F. Kirby of the Nushka, J. P. Rich of the Surf and J. W. Stafford of the Willada. The photos of the yachts are printed so exquisitely that they deserve to be framed. We have rarely had the pleasure of seeing so beautiful a catalogue. Its value, of course, to the company lies in the hearty nature of the letters.

Capt. Jacob S. Winslow, senior member of the firm of J. S. Winslow & Co., ship builders, brokers and chandlers of Portland, Me., died very suddenly last week. Mr. Winslow was born in Pembroke, Me., in 1827, and began to follow the sea when fourteen years of age, continuing in that calling until 1862. In that year he opened a ship chandlery store in Portland, and began to build ships first in Pembroke and later in East Deering. He and his firm built more than 100 vessels, and the firm now holds a controlling interest in about ninety. The Winslow flag, a letter "W" on a blue background, is a familiar sight in most of the big harbors of the world. Capt. Winslow was president of the International Steamship Co., a director of the Portland Steamship Co., Maine Steamship Co., Harpswell Steamboat Co. and Machias Steamboat Co., was among the incorporators of the Portland Lloyds, vice-president of the Casco National bank and a former president of the Portland board of trade.

To the statement that "of the exportable surplus of grain from our own great west seven-eighths of it finds its market through United States channels, paying tribute to that country and losing prestige for the country of its growth," the Montreal Witness replies: "As a matter of fact, our No. 1 hard Manitoba wheat, good grain that it is, is in little danger of losing its identity to any appreciable extent or Canada the prestige of growing it. As for whatever amount of our grain reaches the seaboard by way of Buffalo and other United States lake ports, the cause has been partly that we have not enough vessels to handle it in the six weeks or so when it must be rushed across the lakes, and will not permit American vessels to bring it to our own St. Lawrence ports, and it is also due to the fact that the United States buyers are legitimate purchasers of Canadian grain and can ship it by what route they please. We cannot hope to have a fleet large enough to handle this grain until our side of the lakes is more thickly populated, otherwise the bulk of it would have to lie up for more than three-quarters of the year."

The Wellman-Seaver-Morgan Engineering Co. of Cleveland has increased its capital stock from $500,000 to $1,000,000. The company has just placed a contract with the Garry Iron & Steel Co. of Cleveland for the structural work for a new building 300 ft. by 111 ft. as an addition to their plant now under construction.

The Pittsburgh Steel Casting Co. has been organized with a capital of $300,000 to make steel railway castings. Thirty acres of land have been purchased at Tarentum and a plant giving employment to 300 men will be erected.

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A Splendid Book and a Timely One

Is the title of a book recently written by Lieut. Comd'r Austen M. Knight, executive officer of the cruiser Olympia. The title of the volume could not be more appropriate. Seamanship is as old as the deluge. From century to century, through the connecting link of generations, seamanship has been handed down to us. Until as late as forty years ago seamanship was the supreme art of the sea.

But changes, wonderful to contemplate, have marked the last half century. The name of the great revolution was steam. Through its agency seamanship lost its old command. It became subordinate to the science of navigation. All existing volumes upon seamanship speedily became obsolete. But yesterday of unquestioned authority, today they are merely junk. Such is the moving panorama of the world's progress that its views appear, like opportunity, but once upon the scene and are gone. How appropriate, therefore, is its title "Modern Seamanship." It has to do with seamanship as it exists today, when every sea is charted, when even the rise and fall of the tides in every part of the world is computed by machinery, when hurricanes can hurl their awful force against the ocean liner—not to destroy but merely to check. "The hurricane reached its maximum at twelve and the Kronprinz Wilhelm checked down"—the dispatches will say. Checked down to what? To 19 knots. Twenty-five years ago there wasn't a steamship afloat that could make 19 knots in the smoothest sea that ever was sailed. This is the seamanship the book deals with. It embraces all, the old and the new, but its great virtue is that it is distinctly modern.

We are in the business of handling books, but when the printer sent us this product of his handiwork, we complimented him. It is a large book but it is superb to the least detail of its 428 pages, to which must be added 136 of the finest and clearest plates we have ever seen. No book has received more favorable notices. Even the daily press, usually as dumb as oysters when a technical volume appears, have devoted columns to it. It has been adopted as a text book at the United States Naval Academy. We should think that every person interested in modern seamanship, in the science of navigation, in the building, equipping and managing of a ship would want it. We shall be glad to send it to anyone. THE PRICE IS $6.

THE MARINE REVIEW PUBLISHING CO.,

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"PRESERVO" WILL NOT CRACK, SCALE, FREEZE OR STICK—SEE PAGE 8.

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The Marine Iron Works, station A, Chicago, are now running full in their new shops with entirely new and remodeled equipment and plant. The wisdom of greatly increasing their capacity is already being demonstrated, as every department of the work is overcrowded with orders. They have just closed a contract for a large amount of machinery for the Tabasco-Chiapas Trading & Transportation Co., one of the great commercial companies doing business in the tropics. Among other notable pieces of work is the complete equipment of a fine river steamer for the Zaragoza Mining Co., operating on the Magdalena river, in the United States of Colombia. They have also several steel boats under contract to be erected according to the ingenious plan of "knock-down" construction, which the Marine Iron Works have developed. The advance pages of their 1902 catalogue have been received. Besides very interesting data and illustrations of the engines that they build, this catalogue contains several pages descriptive of the "knock-down" method of building boats. How far afield the business of this company reaches is illustrated by the fact that they are at present doing work for Constantinople, for the Saskatchewan, Venezuela, Colombia and Brazil, as well as all over the United States. 8

Position or Partnership.

A ship and engine builder, with a thorough experience in all branches of the business, both theoretical and practical, and with a reputation that compares favorably with that of any ship builder in the country, is desirous of opening negotiations with persons anxious to engage the services of a strictly first-class man, either to start a new yard of the most advanced type, or with a view to developing an established plant along the lines of the most economical policy known to American ship building. Experienced in all types of steamships, including battleships, cruisers, torpedo boats, Atlantic liners, yachts, etc., and particularly equipped for the construction of cheap and economical freighters and tramp steamers.

As an evidence of good faith I am willing to invest $20,000 with my services in a promising concern that will bear the strictest investigation. No small offers considered.

Address MANAGER OF SHIP YARD,
Care of Enoch W. C. Greene, Attorney-at-Law, 333 Walnut St., Philadelphia, Pa.

U. S. ENGINEER OFFICE, Jones Building, Detroit, Mich., April 19, 1902. Sealed proposals for dredging, and other work required for removing obstructions to navigation in main Ship Channel, between Sault Ste. Marie, Mich., and Lake Huron, will be received here until 12 noon (Standard time), May 19, 1902, and then publicly opened. Information furnished on application. W. H. BIXBY, Major, Engrs. May 15

Sealed proposals will be received at the office of the Light-House Board, Washington, D. C., until 2 o'clock p. m., June 6, 1902, and then opened, for furnishing the materials and labor of all kinds necessary for the construction and delivery of the twin-screw steel steam light-house tender Crocus for a fixed sum for said vessel delivered either at the Buoy Depot, Buffalo, N. Y., or at the Light-House Depot, Tompkinsville, N. Y., as will be determined upon by the Light-House Board. Proposals, plans and specifications can be had by applying to the Light-House Board, Washington, D. C., or at the office of the Light-House Inspector, Buffalo, N. Y. NORMAN H. FARQUHAR, Rear-Admiral, U. S. N., Chairman. May 15.

Sailing Vessel Wanted.

Vessel of 200 tons; 10 ft. draught, loaded; centerboard. Address P. O. Box 72, Mobile, Ala. May 29.

Scotch Boiler For Sale.

Scotch boiler, 14 ft. diameter by 13 ft. Lying at Detroit Ship Building Co.'s Works. Address James Corrigan, 41? Perry-Payne bldg., Cleveland. tf.

Engine and Boiler Wanted.

Wanted—A 14x16 or 16x16 marine engine; also boiler of sufficient capacity to supply steam for same at not less than 125 lbs. pressure. Address 407 Chamber of Commerce building, Toledo, O. May 29.

Barge For Sale.

Of about 500 M lumber capacity. Rates A2½. In good shape. Practically all rebuilt a year ago. Thoroughly recalked this winter. Price $3,500. Address Box 27, the Marine Review Pub. Co., 39-41 Wade building, Cleveland. tf.

BELLEVILLE GENERATORS

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Originated 1849 — Latest Patents 1902

Number of Nautical Miles made each year by Steamships of the Messageries Maritimes Co., Provided with Belleville Generators—Since their Adoption in the Service.

Year.	Australien	Polynésien	Armand Béhic	Ville de la Ciotat	Ernest Simons	Chili	Cordillère	Laos	Indus	Tonkin	Annam	Atlantique
1890	67,728	2,460										
1891	68,247	68,331	204									
1892	68,247	68,403	69,822	23,259								
1893	68,379	68,343	68,286	68,247								
1894	68,439	68,367	68.574	68,439	37,701							
1895	68,673	68,766	68,739	68,808	40,887	28,713						
1896	69,534	92,718	69,696	69,549	62,205	63,153	40,716					
1897	68,250	69,606	92,736	69,555	62,235	76,110	63,357	43,146				
1898	70,938	69,534	69,552	69,597	62,526	63,240	63,240	62,553	63,954	22,707		
1899	69,534	69,615	67,431	90,405	60,246	62,778	62,868	52,344	54,855	44,007	22,884	
1900	69,534	67,494	69,744	69,564	61,719	62,382	62,502	51,471	53,373	62,016	63,066	52,140
1901	44,220	69,627	69,594	66,948	51,057	62,460	62,490	61,743	62,688	43,866	62,466	63,126
Total	801,723	783,264	714,378	664,371	438,576	418,836	355,173	271,257	234,870	172,596	148,416	115,266

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